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Training Modules on Digital Learning Resources in PATHFit 1: Shaping Digital Skills for College Physical Education Instructors

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Abstract — This study aimed to analyze, design, develop, implement, and evaluate training modules on digital learning resources (DLRs) to enhance the digital skills of college Physical Education (PE) 1 instructors. Based on the ADDIE instructional design model and Kolb's Experiential Learning Theory, the study addressed the growing need to enhance digital competencies within the context of the new PATHFit 1 curriculum, "Movement Competency Training." A needs assessment was conducted using Vinci's (2017) Digital Skills Survey Questionnaire (DSSQ), which identified content creation as the least developed skill among the five core digital skill domains: information, communication, content creation, safety, and problem-solving. Based on these findings, a Task Analysis Chart (TAC) was crafted to inform the instructional design. Five DLR-based training modules were then developed and validated by a panel of experts, producing high evaluation scores in terms of content, relevance, structure, and alignment with intended learning outcomes. The training modules—ranging from digital portfolios to fitness vlogs—were implemented with college PE instructors and evaluated using Kirkpatrick's Four-Level Evaluation Model. Results revealed significant improvements in participants' engagement, skill acquisition, and application, particularly in content creation. The REGH Model (Review, Engage, Generate, Hone) was proposed to address ongoing digital skill development. Observations and feedback from both participants and expert evaluators confirmed the effectiveness and suitability of the modules in enhancing digital teaching practices in physical education. This study contributes to the advancement of digital pedagogy by providing targeted, validated, and implementable instructional materials that support 21st-century physical education instruction.

Keywords — Digital skills, Training Modules, Digital Learning Resources, REGH Model of Digital skills

I. Introduction

Refining the digital proficiencies of college instructors has become imperative in embracing the demands of the 21st century, characterized by the Information Age. Studies reveal that technology has reached its pinnacle, especially in teaching physical education, thanks to the convenience of modern digital technology. This transformation has elevated the quality and capability of instructional levels (Tsai & Zhang, 2021). The Digital Learning Resources (DLRs) are resources such as applications (apps), software, programs, or websites that engage students in learning activities and support students' learning goals (Zehler et al., 2020). For this study, DLR refers to any digital technology powered by internet connections that engages in learning and

performing skills through forms like podcasts, TikTok, vlogs, YouTube editing, video presentations, video conferences, and others. Among these digital forms, the study by Abejero et al. (2023) on the utilization of social media in learning PATHFit courses at a Philippine state university revealed that YouTube is the most commonly used social media platform by college instructors. Notably, this educational platform draws inspiration from emergency remote teaching (ERT), a global practice that emerged during the onset of the pandemic (Trust & Whalen, 2021).

College Physical Education instructors are encouraged to adopt effective pedagogical approaches, such as the use of modules, to optimize the use of technology in instruction (Kilag et al., 2023). These approaches in the teaching and learning process discourage a sedentary lifestyle among students and provide instructors with ideas for establishing an engaging classroom (Martinez-Gonzalez et al., 2021). The World Health Organization's Report (2010) signifies that physical inactivity is the fourth leading risk factor for global mortality. The leading cause of this fatality is hypokinetic diseases like diabetes, hypertension, and even cancer brought about by the sedentary lifestyles of young learners worldwide (Mercier et al., 2021)

The emergence of mobile and digital technologies underscores the need for educators to cultivate digital skills that usher in innovative approaches to learning and teaching. This is particularly evident in the instruction of the new college Physical Education program, PATHFit 1 Movement Competency Training. Physical Education college instructors find themselves compelled to enhance their digital skills through interactive and high-quality digital and technological instructional training modules. These modules serve not only to promote fitness and wellness but also to position instructors as dedicated pioneers for health and empowered global collaborators for change (Bull et al., 2020).

In the Philippines, numerous studies have been conducted in the field of education, revealing the impact of the use of DLRs as a pedagogy for learning. Most of these studies have uncovered a positive correlation between college instructors' digital skills inside the classroom. However, less is known about the influence of technology-based learning on improving physical fitness in physical education classes, particularly in Philippine State Colleges and Universities (Jesus et al., 2022). A recent study of Tolentino et al. (2022) focused on crafting a mobile application tailored for Movement Competency Training (MCT) within PATHFit 1 classes. It revealed a notable enhancement in movement skills facilitated by mobile instructions. Furthermore, the researchers aspired to create a mobile application for MCT that not only demonstrated high functional usability but also proved to be well-suited for its intended purpose.

CHED has further outlined guidelines through Memorandum Order No. 40, series of 2021. This order, known as implementing flexible learning for tertiary Physical Education PATHFit courses, aims to assist Higher Education Institutions (HEIs) in developing adaptable learning strategies for the effective delivery of PATHFit courses. Aligned with CHED's overarching goals, as articulated in 2021, the memorandum seeks to "improve the Filipino quality of life" by encouraging students to "Move, Move, and Move!" In response to the evolving landscape of

tertiary Physical Education, now known as PATHFit courses, there arises a necessity to bridge the gap between Commission on Higher Education (CHED) goals and the challenges associated with delivering a hybrid method of teaching and learning.

The central focus of this investigation is to formulate comprehensive training modules for the PATHFit 1 course. These modules, meticulously designed, seamlessly integrate movement skills through interactive DLR tools. Its development aims to enhance the delivery of high-quality college Physical Education courses throughout the University of Science and Technology of Southern Philippines system. By addressing an existing gap in pedagogical approaches, this initiative aims to enhance the digital skills of college physical education instructors, thereby elevating the PATHFit courses to a significantly higher standard within the academic framework.

Objective of the Study

This study aimed to analyze, design, develop, implement, and evaluate the training modules on physical education digital learning resources to enhance the digital skills of college Physical Education 1 instructors.

Specifically, it sought to:

1. Analyze the five (5) essential digital skills framework needs of college physical education instructors in terms of:
    1.1. information;
    1.2. communication;
    1.3. content creation;
    1.4. safety; and,
    1.5. problem-solving
2. Design the training modules utilizing PATHFit 1 DLRs to improve the digital skills of college physical education instructors;
3. Develop and validate the training modules for college physical education instructors;
4. Implement the training modules utilizing PATHFit 1 DLRs for college physical education instructors; and,
5. Evaluate the suitability of the training modules for college physical education instructors.

II. Methodology

Research Design

The study employed the Research and Development (R&D) approach, which forms the core of instructional design. Research and Development have been utilized to create numerous innovations that enhance the quality of learning and teaching for students. Most research conducted using R&D methodology focuses on developing curriculum, teaching methods, teaching models, or assessment models. Research and Developmental, as opposed to simple instructional development, has been defined as "the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet the criteria of internal consistency and effectiveness" (Seels & Richey, 1994).

The ADDIE model of instruction guides this study, particularly in the design and development of Digital Learning Resources (DLRs) based on interactive internet-powered software and website applications (apps). Educational designers and developers widely use the ADDIE model as one of the best design models for developing software and applications in digital technology-based teaching (Rossi & Mustaro, 2013).

Research Locale

The study was conducted at the University of Science and Technology of Southern Philippines (USTP) – Cagayan de Oro City, the main campus of the university.

Participants of the Study

The participants consisted of 12 females and 13 males, equivalent to 25 Physical Education instructors responsible for teaching the PATHFit 1 – Movement Competency Training course at the University of Science and Technology of Southern Philippines System (USTP). All participating instructors taught the PATHFit 1 course from the beginning of the first semester to the end of the 2023-2024 school year.

Research Instruments

This study employed six instruments to adequately address its purpose. The researcher adapted these instruments to develop, implement, and evaluate the training materials and the training on Digital Learning Resources (DLRs) for PATHFit instructors. Experts in the fields of digital skills, digital technology, physical education and fitness skills, instructional systems design, material development, assessment, and language conducted a thorough examination to validate these instruments.

The Digital Skills Needs Assessment of the College Physical Education Instructors in terms of the Five (5) Framework: Information, Communication, Content Creation, Safety, and Problem Solving

The researcher analyzed the needs of PATHFit instructors in conjunction with the five essential digital skills framework, covering the components of information, communication, content creation, safety, and problem-solving. The needs analysis of this study used the Digital Skills Survey Questionnaire (DSSQ) adapted from vINCI (2016). The instrument was tested prior to the study and demonstrated a reliable Cronbach's alpha of 0.943. The conducted needs assessment identified the specific digital skill level of the instructors, ranging from level 5.00 – indicating *very highly skilled* – down to level 1.00 – with a descriptive statement of *not skilled at all*.

Range	Rating	Description
4.21 – 5.00	Very Much	Exceptionally Skilled
3.41 – 4.20	Much	Highly Skilled
2.61 – 3.40	Just Enough	Moderately Skilled
1.81 – 2.60	Not Much	Least Skilled
1.00 – 1.80	Not at All	Not Skilled at all

Instructional Materials Review Form

The researcher used the Instructional Materials Review Form (BukSU CITL, 2018) to validate the training materials developed prior to the implementation phase. It contains items categorized under the following headings: title, preface, introduction, learning outcomes, discussions, examples, and exercises. The five instructional materials experts checked the column that corresponds to their validation of the material, using the following reference:

Scores	Rating	Description
4.21 – 5.00	Very Much Evident	Features are very much adequately provided
3.41 – 4.20	Much Evident	Features are much adequately provided
2.61 – 3.40	Just Enough Evident	Features are provided
1.81 – 2.60	Not Much Evident	Features are less adequately provided
1.00 – 1.80	Not at All/NE	Features are not provided

Instructional Materials Review Form with TPACK Integration

The researcher modified the instructional materials review form (BukSU CITL, 2016) through integrating items of the Technological Pedagogical Content Knowledge (TPACK) framework: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) (Koehler et al., 2013). It used the same reference as the original form. Experts validated the modified instrument.

Training Modules Evaluation

The researcher adapted the instrument from Vigor et al. (2023) for content validation of the training modules. The instrument was initially designed to assess the interactive spatial intelligence of first-year college architectural students at the University of Science and Technology of Southern Philippines (USTP), Cagayan de Oro City campus.

Scores	Rating	Description
4.21 – 5.00	Very Much Evident	Features are very much adequately provided
3.41 – 4.20	Much Evident	Features are much adequately provided
2.61 – 3.40	Just Enough Evident	Features are provided
1.81 – 2.60	Not Much Evident	Features are less adequately provided
1.00 – 1.80	Not at All/NE	Features are not provided

Observer's Observation Guide

Five expert observers from the Science and Math departments evaluated the training's conduct, using an observation guide to assess the implementation of the training modules. For this, the researcher adapted an instrument from Alava et al. (2022), which features informal observation directed at both the speaker and the participants during the three-day training. The instrument, based on Kirkpatrick's Model of Evaluation, has four levels of criteria: reaction, learning, behavior, and results. These were incorporated with the use of the observer's observation guide. The reference is as follows.

Scores	Rating	Description
1-5	Always Observed	Observation Notes are Always Observed
1-5	Sometimes Observed	Observation Notes are Sometimes Observed
1-5	Never Observed	Observation Notes are Never Observed

III. Results and Discussion

College Physical Education Instructors' Digital Skills Needs: Information

Table 1 showcases the first of the five essential digital skills frameworks, which is information. The overall mean indicates an exceptionally high skill level, with a mean of 4.27. This finding denotes that the college P.E. Instructors are information-literate.

Both indicators 2 and 3 have the lowest mean of 4.20. However, they include a qualifying statement indicating that the participants are highly skilled, which signifies that they are digitally competent, especially in searching for reliable information on the internet. As a result, the overall standard deviation indicates a moderate degree of concentration compared to the mean scores gathered from college PE instructors.

Table 1Digital Skills Needs Assessment of the College Physical Education Instructors

Indicators	Mean	SD	Qualifying Statement
Information			
I can save or store files or content (e.g. text, pictures, music, videos, web pages) and retrieve them once saved or stored.	4.40	0.66	Exceptionally Skilled
I know not all online information is reliable.	4.20	0.61	Highly Skilled
I can look for information online using a search engine.	4.20	0.61	Highly Skilled
Communication			
I can communicate with others using mobile phone, voice over, IP (skype) email or chat – using basic features (e.g. voice messaging, SMS, send and receive emails, text exchange).	4.63	0.58	Exceptionally Skilled
I can share file and content using simple tools.	4.15	0.76	Exceptionally Skilled
I am aware of social networking sites and online collaboration tools.	4.08	0.71	Highly Skilled
I am aware that when using digital tools, certain communication rules apply (e.g. when commenting, and sharing personal information).	4.08	0.58	Highly Skilled
I know I can use digital technologies to interact with services (as governments, banks, hospitals).	4.07	0.74	Highly Skilled
Content Creation			Highly Skilled
I am aware that content can be protected by copyright.	3.10	0.68	
I can produce straightforward digital content (e.g. text, tables, images, audio files) in at least one format using digital tools.	2.50	0.63	Moderately Skilled
I can make basic edits to content produced by others.	1.90	0.60	Least Skilled
I can apply and modify simple functions and settings of software and applications that I use (e.g. change default settings)	1.80	0.60	Least Skilled
Safety			
I know I should not reveal private information online	4.13	0.73	Highly Skilled
I am aware that my credentials (username and password) can be stolen	4.03	0.72	Highly Skilled
I know that using digital technology too extensively can affect my health.	4.00	0.74	Highly Skilled
I can take basic steps to protect my devices (e.g. using anti-viruses and passwords)	3.93	0.64	Highly Skilled
Problem Soliving			
I can find support and assistance when a technical problem occurs or when using a new device, program or application	3.63	0.71	Highly Skilled
I know how to solve some routine problems (e.g. close program, re-start computer, re-install/update program, check internet connection	3.30	0.69	Moderately Skilled
I know that digital tools can help me in solving problems. I am also aware that they have their limitations.	3.30	0.64	Moderately Skilled
When confronted with a technological or non-technological problem, I can use the digital tools I know to solve it.	3.30	0.69	Moderately Skilled

The results reveal a close alignment with the mean score, suggesting consistent competence in dealing with information, which is vital for teaching the PATHFit courses. Despite the high

competence in digital skills in the information area, some indicators still require enrichment and training, particularly in assessing, investigating, and critically evaluating data.

The findings from this study support Aguinaldo's (2021) research on teaching online classes, highlighting the challenges faced, particularly in finding reliable information for lesson preparation. Challenges are attributed to inconsistent internet connections, the unavailability of reliable teacher training on information technology, and a lack of equipment, which hinders some college instructors in their lesson preparation. Indeed, a well-informed instructor creates a conducive teaching and learning environment that motivates students to maximize their participation and performance and helps them develop their full potential.

College Physical Education Instructors' Digital Skills Needs: Communication

Table 2 illustrates the level of digital skills among college physical education instructors in terms of communication. As indicated in the table, participants demonstrate both exceptional and high skills in communication, with an overall mean of 4.27. This suggests that college physical education instructors are *exceptionally skilled* in the realm of communication.

This research finding aligns with the study of Montilla et al. (2023), which also demonstrates a high proficiency level of physical education instructors' pedagogical digital skills and competence. The level of PATHFit Instructors' digital skills, as evaluated in terms of communication, shows a high-skilled level mean and standard deviation (SD), signifying that college physical education instructors are digitally skilled in utilizing different Digital Learning Resources (DLRs), specifically using their smartphones as a means of delivering communication in class.

Table 2 The Use of Digital Learning Resources (DLR) Needs Assessment

Digital Learning Resources	Mean	SD	Description
Digital Productivity Tools			
Video Chat Edmodo Exercise Apps FB Reels	3.73	1.20	Highly Knowledgeable
Audio Editing Google Drive	2.00	0.83	Less Knowledgeable
Video/Audio Editing	2.00	0.83	Less Knowledgeable
	2.00	0.83	Less Knowledgeable
	2.00	0.82	Less Knowledgeable
	1.90	0.80	Less Knowledgeable
	1.90	0.81	Less Knowledgeable
Digital Academic Content Tools			
E-mail Google Form			
Twitter/Instagram You Tube App Tiktok	4.80	0.55	Exceptionally Knowledgeable
Digital Portfolio Podcast	4.67	0.60	Exceptionally Knowledgeable
Vlog	4.20	0.96	Exceptionally Knowledgeable
	1.71	0.62	No Knowledge
	1.71	0.65	No Knowledge
	1.62	0.67	No Knowledge
	1.37	0.60	No Knowledge
	1.07	0.57	No Knowledge

Digital Communication Tools			
Texting	4.93	0.25	Exceptionally Knowledgeable
Google Meet/Zoom Messenger	4.93	0.55	Exceptionally Knowledgeable
Google Form Facebook Page Facebook	4.80	0.61	Exceptionally Knowledgeable
Twitter\Instagram	4.67	0.84	Exceptionally Knowledgeable
	4.30	0.84	Less Knowledgeable
	2.43	0.54	Less Knowledgeable
	1.90	0.60	Less Knowledgeable

College Physical Education Instructors' Digital Skills Needs: Content Creation

College physical education instructors were found to be least skilled in digital content creation, with an overall mean of 2.40, the lowest among the five digital skills frameworks. Participants struggled most with editing and using software on desktops and laptops. While awareness of digital content rules, such as copyright, was relatively high (mean = 3.10), practical application remained challenging, as shown by the lowest mean (1.80) for modifying software functions.

A high standard deviation (0.63) indicates varied proficiency, emphasizing the need for focused training in content creation. Instructors face difficulty using digital tools and producing effective instructional materials. To address this, further training is recommended, with an emphasis on engaging formats such as vlogs, podcasts, and social media content (Stapleton, 2022).

College Physical Education Instructors' Digital Skills Needs: Safety

Data show that college physical education instructors are highly skilled in digital safety, with an overall mean of 4.02, indicating a strong awareness of threats such as viruses, identity theft, and cyberbullying. Participants understand the risks of oversharing personal information and excessive internet use, suggesting they are both mentally and physically prepared for hybrid teaching environments.

However, the lowest-rated indicator (mean = 3.93) points to limited knowledge of antivirus software and password security. Despite this, a low standard deviation (0.70) suggests participants generally feel safe online.

Research supports these concerns, noting that many users—especially educators and students—remain vulnerable online (Tsai et al., 2016). Social media misuse in educational settings has also contributed to increased psychological stress, highlighting the urgent need for digital safety training (Zhou et al., 2018; Akour et al., 2021).

College Physical Education Instructors' Digital Skills Needs: Problem Solving

Regarding problem-solving, the findings revealed that college physical education instructors may have difficulty identifying problems related to either digital technology or digital tools, with a lower overall mean (3.38). This suggests a moderate level of digital skills among college physical education instructors. Most indicators in the digital skills area of problem-solving show a moderately skilled level, ranking second to content creation in terms of the lowest overall average. This suggests that participants find difficulty both in creating relevant content and solving problems related to digital technicalities.

The training modules are designed and developed to reshape the digital skills of college physical education instructors. These training sessions must engage participants in interactive activities that challenge and utilize their problem-solving skills. Problem-solving involves using logic to comprehend and address challenges, coupled with imagination and creativity.

College Physical Education Instructors' Needs on Digital Resources

Based on Table 2 of the DLR needs survey, five Digital Academic Content tools with the lowest mean scores (1.00–1.80, indicating "no knowledge") were identified as the study's focus: YouTube and TikTok (1.71), Digital Portfolio (1.62), Podcast (1.37), and Vlog (1.07).

These tools are increasingly relevant—digital portfolios are now standard in many professional settings (Hong et al., 2022), while YouTube has become a key platform for educational content, including fitness (Zhou et al., 2020). However, studies show that podcasting and vlogging remain underutilized in education, particularly in physical activity courses like PATHFit, underscoring the need for further exploration and training (O'Bannon et al., 2013; McNamara et al., 2022).

Designing the Training Modules Utilizing DLR to Improve the Digital Skills of the College Physical Education Instructors

The second phase of the ADDIE model—the design phase—focused on developing instructional strategies for content creation, the weakest skill identified in the needs analysis. To guide this, the researcher created a Task Analysis Chart (TAC), aligned with Franzone's (2018) concept of breaking down skills into smaller tasks. The TAC served as a blueprint to structure and refine the training modules.

Informed by Kolb's Experiential Learning Theory, the design emphasized active, reflective, and creative learning. Each of the five modules included activities that encouraged critical thinking and content production using DLR tools, which were aligned with the PATHFit 1 course. The TAC helped ensure clear objectives, relevant strategies, and practical task execution to support effective and user-friendly instructional design.

Developing and Validating the Training Modules for the College Physical Education Instructors

PATHFit 1, titled Movement Competency Training, is one of four core courses in the College Physical Education program (CHED Memo No. 39, s. 2021). It emphasizes fundamental movement skills combined with health-related exercises to support functional fitness and sports performance. Instructors are expected to transfer movement competencies across various contexts using appropriate training modules and materials.

The evaluation results showed strong overall satisfaction among experts. However, some training module exercises were found misaligned with the intended learning outcomes (ILOs), likely due to learner diversity, including Students with Additional Needs (SWAN). This study aligns with Tolentino & Dizon (2022), reinforcing that movement competency training demands a higher level of instructional proficiency, best supported by user-centered digital learning resources.

Implementing the Training Modules Utilizing PATHFit 1 DLRs for College Physical Education Instructors

The fourth phase of the ADDIE model evaluated the five training modules using the PATHFit 1 DLR tool apps, with a focus on their suitability for college physical education instructors. Evaluation used a modified version of the Instructional Materials Review Form (BukSU CITL, 2020), integrating the TPACK framework, particularly Technological Knowledge (TK), to assess the use of technology, DLR app criteria, and learning outcomes.

The modules received a high overall mean of 4.90 for criteria and 4.89 for rubric clarity, indicating strong participant understanding. However, the lowest score was in setting examples, reflecting a common challenge in digital instruction. As noted in Li's (2020) study, providing clear, guided examples is essential for effective online learning.

Evaluating the Suitability of the Training Modules for College Physical Education Instructors

This final phase of the ADDIE model evaluated the effectiveness of the five training modules using PATHFit 1 DLR tool apps, with a focus on improving participants' weakest digital skill—content creation. Needs assessment results showed low proficiency in content creation, moderate skills in problem-solving, and higher competence in information, communication, and safety, guiding the module design toward digital academic content tools.

In the Technical Quality Assessment, Module 2: Fitness TikTok Challenge received the highest mean (4.91), reflecting high participant engagement, while Module 5: Fitness Vlog scored lowest, highlighting challenges in video editing using smartphones. For Instructional Quality,

Module 3: Create Podcasting Using Smartphone Apps scored highest (4.93), confirming the effectiveness of podcasts as learning tools, whereas Module 5 again scored lowest (4.71).

Overall, assessments across content, technical, and instructional quality showed strong agreement among experts and participants that the modules were highly adequate. These modules effectively support digital pedagogy in PATHFit 1, combining learning, engagement, and the development of 21st-century skills.

Observers' Evaluation of the Implementation of the Five (5) Training Modules by Kirkpatrick's Theory of Evaluation

Five observers—two guests and three faculty members from the College of Science and Mathematics—evaluated the training using an observation guide adapted from Alava (2017), which focused on both the speaker and participants. Based on Kirkpatrick's four-level Evaluation Model (reaction, learning, behavior, and results), the results in Table 26 showed that 80% of indicators were consistently observed, reflecting a confident speaker and motivated, engaged participants. Only 20% were occasionally observed.

Overall, the observers concluded that the training was successfully implemented. The modules were effective, the speaker demonstrated strong technical knowledge and preparedness, and the participants showed active involvement and skill development, indicating a meaningful and impactful three-day training experience.

IV. Conclusion

Prior to the training, college physical education instructors demonstrated the lowest proficiency in digital content creation, underscoring the urgent need for targeted development as education rapidly transitioned to a technology-based environment. The Task Analysis Chart (TAC) played a crucial role in guiding the design of the training modules, ensuring that outcomes, learning activities, and digital outputs were well-aligned. The modules themselves were found to be relevant, user-friendly, and engaging, effectively capturing the instructors' interest and facilitating the development of their digital skills. The successful implementation of all five modules was characterized by active participation and high-quality outputs, which fostered a more personalized and meaningful learning experience. As a result, instructors showed significant improvements in digital competencies, particularly in content creation. Grounded in the ADDIE framework, experiential learning principles (Kolb), and evaluated through Kirkpatrick's model, the training ultimately led to the development of the REGH Model (Review, Engage, Generate, Hone)—a practical and sustainable approach for ongoing digital skills enhancement in physical education.

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