Instructional Strategies to Produce Educational Media Systematically

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Abstract

The main research purpose focused on investigating the instructional strategies to produce educational media systematically. The qualitative research methods were conducted by in-depth interviews with the experts and undergraduate students on effectively designing these instructional strategies. The participants consisted of two groups; 1) nine experts in the field of instructional strategies. 2) twelve undergraduate students. Research instruments were two semi-structured interviews with open questions; 1) two sets of interview questions designed for those specialists, and 2) the interview questions designed for an excellent student. Collected data was analyzed and categorized into key issues. The results were presented in descriptive analysis. The findings revealed as following: 1) two main popular instructional media types as follows; 1.1) digital media and 1.2) handmade media 2) the instructional strategies as follows: 2.1) ADDIE included analysis, design, development, implementation, and evaluation. 2.2) 3P included pre-production, production, post-production 2.3) project-based learning 2.4) design-based learning, and 2.5) creative-based learning. 3) teaching techniques and methods encourage students such as case studies, best practices, creative practice, questions, discussion, brainstorming, team-based/group, etc. 4) organized activities to encourage students with active learning, creative knowledge, and instructional media systematically. 5) online tools and new technology could be active learning tools and motivate learners to create new media. Moreover, learning engagement, social media, and immediate feedback could engage students efficiently. 6) media evaluations should be evaluated on the design, production processes, and results. 7) the crucial factors consist of 1) instructional strategies/teaching techniques 2) teachers 3) students 5) materials, equipment, and supporting tools 6) learning environments 7) the work process. 8) the limitations are as follows; 1) teachers 2) students 3) time-limited 4) budget-limited.

Keywords: educational media production, instructional strategies, media production, systematic approach, systematic learning, teaching technique

1. Introduction

1.1 Background

Communication is important to convey messages from sender to receiver and make people understand each other. In the part of education. Topothai (2019) described that educational communication is the process of transferring content related to teaching and learning from the sender to the receiver. This process runs through media or channels to change their receivers' behavior according to the senders' objectives. Boonmee (2021) explained that instructional media is the mediate tools that support learning between teachers and learners. Instructional media could be materials, equipment, and methods, including learning resources that transfer knowledge and experience to learners. Then, learners could change in desired behavior. Learners can create their knowledge and accomplish the learning objectives.

Mungprasert, Prawatrungruang and Sriprasertpap (2022) studied the problem of teachers' competency in Thailand. They found that teachers cannot design diverse learning and lack knowledge in selecting and using innovative media and technology to suit the content and students' ages. Media innovation and technology are not enough. Nonthamand and Mahawong (2023) studied the needs assessment of teachers' instructional video production ability. The results of the needs analysis showed that the most urgent need in teacher development concerning instructional video production was video delivery, followed by the ability to develop and design instructional videos. In terms of the problems and obstacles most frequently encountered in producing

instructional videos, the teachers in Phayao lacked the basic knowledge of video production and the ability to shoot and design instructional videos, respectively. Therefore, instructional media production should be considered to solve this problem.

The 21st-century learning, the teachers' roles are not only to create instructional media but also to motivate their students to complete 21st-century learning skills in three areas: cognitive skills and innovation, information and media and technology skills, and life and career skills. Therefore, teachers need to create suitable media for use in their classrooms (Boonmee, 2021). In Mahasarakham University, Thailand, undergraduate students who studied in education programs need to take a course and enhance their abilities to design and produce instructional media. Then, they could plan to use their instructional media in the classroom and digital learning environment efficiently (Faculty of Education, Mahasarakham University, 2019). Instructional media production is one of the important abilities for undergraduate students who study in education programs. Instructors who teach in education programs must redesign the courses that integrate instructional strategy to systematically enhance instructional media production for undergraduate students.

Instructional strategy is a concept, guideline, approach, or main line to conduct, measure, and evaluate instruction. Therefore, an instructional strategy has to consider many instructional components before it is implemented, such as learners, learning objectives, contents, learning context, overall context, conditions, and lecturers' skills in selecting learning principles, and techniques to accomplish the specified learning objectives. The principles of designing instructional strategies are aligned with both lecturers' teaching skills and learners' learning styles (The Royal Institute, 2012).

The previous literature showed that most educators and instructional designers applied ADDIE which stands for analyze, design, develop, implement, and evaluate as a framework for designing and developing education and training programs. Instructional designers and training developers found this approach very useful. The steps were clearly defined to facilitate the use of practical training tools. In the part of instructional design, ADDIE has found widespread acceptance and applied for many years (Kurt, 2018). In Thailand, I found that most instructors and instructional designers applied ADDIE as a framework for designing instructional models, and instructional media. Kanjug (2016) described that ADDIE was the instructional design system. Media developers have applied ADDIE widely that can help media developers and even developers in other fields as well as school teachers to design effective teaching both in the classroom and online courses.

The previous research showed instructional media production based on ADDIE, for example. Ananpatiwet, Tubtimtong and Cinmuk (2021) developed video media based on the ADDIE model for nursing care for high-risk preterm infants. In conclusion, the developed VDO was an efficient teaching medium. Teachers can use it as teaching material, and students can use it for self-learning outside the classroom and it would affect the development of knowledge for students. Chabudboontarik, Suracitto, Rinrit, Namseethan and Pengtham (2022) developed the digital media on world regions and historical development, based on the ADDIE Model, for Mathayomsuksa 3 students. The result was distributed to five fifty-minute lessons, each of which consisted of achievement tests. Digital media comprises the content in the formation of messages, graphics, audio, videos, and images. The experts evaluated these digital media that was at a high, and the efficiency of these digital media was higher than the standard criteria. The learner's achievement after learning was found to be higher than before learning. Therefore, ADDIE could be the main guideline instruction for educational media production systematically.

Additionally, 3P which also supports the production of educational media systematically includes three steps; pre-production, production, and post-production. For example, Phakdeepattanakun and Sinjindawong (2022) designed an active learning activity for promoting content writing skills in video microlearning media. They organized the principles of 3P video media creation on learning activities. The results found that the participants were able to create video micro-learning media higher than standard and they were able to improve their content writing skills. Ayuwong, Saraboon and Tungsathitkul (2023) developed digital video production using storytelling of the death railway. They designed on 3P process and storytelling was applied for video media production. The results showed that the quality evaluation of the digital video was at a high level. Kaewchanpech1, Khinhom and Sudsanguan (2023) developed video media with B-Roll filming techniques. They designed the 3P process of media production. The quality assessment results by experts in video production techniques were very good. Therefore, the 3P process of media production could also support educational media production systematically.

Moreover, teaching techniques and methods are crucial to motivate and engage students such as problem-solving, self-learning, brainstorming, discussion, questions, and, graphic organizers (Kammanee, 2019; Seechaliao, 2017;

Wongyai & Patphol, 2021). The teacher's role could motivate and engage students also. Teachers should encourage, promote, and support their students by asking questions, evaluating, and providing useful feedback for the student's learning development (Wongyai & Patphol, 2021). Utilizing a new technology could be an active learning tool and motivate learners to create new things (Janpirom, Kunlaya, Roungrong, & Kaewurai, 2019). Social media can also engage students in learning activities and create innovation (Seechaliao, 2017). Therefore, the instructional strategies need to be redesigned with teaching techniques and new technologies to enhance undergraduate students' abilities in educational media production systematically.

1.2 Research Objective

The main research objective was to investigate the instructional strategies to enhance instructional media production systematically

2. Research Methodology

2.1 Methodology

The objective was to investigate the guides on how to design instructional strategies that enhance instructional media production systematically for undergraduate students. The qualitative research methods were conducted by in-depth interviews with the experts and undergraduate students on how to design these instructional strategies effectively.

2.2 Participants

The participants consisted of 2 groups;

1) Nine experts in the field of instructional strategies that support instructional media production systematically. Among them, five were specialists in instructional design and development, and the other four were in education technology and communications. All specialists were selected by snowball sampling technique.

2) Twelve undergraduate students who were enrolled in the course 0537211 Innovation in Educational Technology and Communications which emphasizes instructional media production in the first semester of the Academic Year 2022–2023 got excellent grades. According to an excellent grade, they have great experience and best practices for producing instructional media systematically. Therefore, they can explain and give the example clearly about the systematic steps for instructional media production. Moreover, these instructional strategies support undergraduate students. Researchers need to collect data concerning undergraduate students' learning styles, learning characteristics, learning activities, and online tools that are most suitable for undergraduate students.

2.3 Research Instruments

The research instrument used a semi-structured interview with open questions related to instructional strategies enhancing instructional media production systematically. There were two interviewing forms;

1) two sets of interview questions designed for those specialists in their expertise. It contained two sets of interview questions designed for those specialists in their expertise. The common sample questions are as follows:

a)   What are the most related types of instructional media to the instructional media production course addressed in your university's bachelor of education program?

b)   What kind of instructional strategies do you design to encourage learners to produce instructional media systematically?

c)   What activities do you stimulate and motivate learners to systematically produce instructional media production?

2) the interview questions are designed for an excellent student. It contained sets of interview questions designed for those excellent students in their individual opinions and experiences. The common sample questions are as follows:

a)   What activities did you learn to stimulate motivate and encourage systematically producing instructional media?

b)   What do you think should be the role of teachers who promote the systematic production of educational media?

c)   What learning resource did you learn to support systematically producing instructional media?

The research instruments were created by reviewing related pieces of literature and analyzing and synthesizing

research papers and case studies on how to design instructional strategies enhancing instructional media production systematically. Then, the instruments were validated by five experts in the related fields: three experts in educational technology and communications, two in designing and developing educational media, and one in educational research and measurement, using the index of item-objective congruence (IOC) measure (Rovinelli & Hambleton, 1977). The interview questions were designed for those specialists in their expertise. The IOC values were 1.00 that indicated suitable for collecting research data. The instruments were pilot-tested with three lecturers from Mahasarakham University and Silpakorn University, Thailand. The interview questions were designed for an excellent student. The IOC values ranged from 0.80 to 1.00, which indicated that was suitable for conducting the study. Some questions need to be revised and added example answers. The instruments were pilot-tested with four students from Mahasarakham University, Thailand.

2.4 Data Collection

1) The data was collected through these two sets of interview questions. Nine experts participated in the study. The interviews were conducted between August 4, 2023, and August 21, 2023.

2) The data was collected through these interview questions. Twelve undergraduate students participated in the study. The interviews were conducted between August 24, 2023, and September 19, 2023.

Collected data were analyzed and categorized into key issues and themes based on literature. There were four steps of qualitative data analysis including 1) data organizing 2) data coding 3) data clustering and 4) finding out the relationship between data to obtain a conclusion. The results were presented in the form of descriptive analysis.

2.5 Ethical Considerations

This research study was approved by Mahasarakham University Ethics Committee for Research Involving Human Subjects (No. 264-208/2023, issued on 24 July 2023). All data were kept confidential.

3. Results

Nine experts and twelve undergraduates who participated in the study gave the interviews. They explained their experiences and gave examples of how to design instructional strategies and learning activities enhancing instructional media production systematically by following these themes;

3.1 The Most Related Types of Instructional Media to the Instructional Media Production Course Addressed in Your University's Bachelor of Education Program

The findings revealed the characteristics of instructional media nowadays. Experts explained that the characteristics of instructional media are as follows:

1) Educational media should accomplish the objectives and learning outcomes set. It is well designed and suitable for the learners, age range, characteristics, and learning styles of learners and also could transfer content to understand easily.

2) Educational media should be considered with the nature of the content, such as the nature of the content that emphasizes practice. The characteristics of educational media should be real or simulated as realistic to understand easily and accomplish objectives. The practical medium combined with learning the content will make the learner remember longer.

3) Educational media should be designed based on the learning needs of modern learners who want to learn in a concise and fast, touch point. The content and presentation must be contemporary. Learners can learn combined with acquiring additional knowledge from external sources. In the current situation, students can easily and conveniently research for additional sources of knowledge.

4) Educational media should be up-to-date and in line with teaching and learning in a diversity of subjects.

5) Educational media should be microlearning according to the content and objectives, short, concise, interesting, and easy to understand in each part.

6) Educational media should be easily accessible. Everyone can access free, fast, convenient, beautiful, matching learning outcomes in each subject. They can learn the guidelines and how to use them for teaching or self-learning. Educational media should state the purpose, and activities and evaluate both in class and online.

7) It should be aware of being available for educational media in diverse school contexts.

Nowadays, educational media is popular to present the entire image, message, audio, and interactive technologies such as AR, VR, AI, etc., or teaching materials, self-learning materials that learners learn at their

own pace, interactive materials that interact with learners. It emphasizes providing learners access to educational materials with convenient, fast, and accomplished learning outcomes

There are two main popular types of instructional media as follows;

1) Digital Media

1.1) Video clip media is a medium that can display images, sound, and animations such as 2D and 3D images. Video clips can be designed and created by 3P processes including 1) pre-production 2) production 3) post-production. In addition, it can be easily distributed to students through online channels on various platforms.

1.2) Audio media in the podcast media form. The production process is easy but the content should be well designed and rely on principles such as storytelling to convey the content to be interesting.

1.3) Graphic media such as infographics represent the analysis and breakdown of the content in the presentation to create a clear understanding of a single image.

1.4) Electronic media such as web applications. Digital media such as educational digital games, teaching videos multimedia lessons, and online VR AR lessons.

2) Handmade Media

2.1) Material media, handmade media

Undergraduates described the characteristics of instructional media as follows:

1) Educational media should be short, concise, interesting, and divided into episodes according to the content and objectives.

2) Content should be updated so that learners can be applied in work and daily life.

3) Educational media should be easily accessible, quick, and convenient. Everyone can learn all platforms for free, at no cost, and unlimited.

4) Learners can learn the educational materials on their own, interact, and know learning outcomes instantly.

3.2 The Instructional Strategies That Support the Production of Educational Media Systematically.

The findings revealed that instructional strategies support the production of educational media systematically. Experts explained these instructional strategies should focus on a system approach. The instructional strategies that support the production of educational media systematically are as follows: 1) ADDIE that includes five steps; analysis, design, development, implementation, and evaluation. 2) 3P that included three steps; pre-production, production, post-production 3) project-based learning 4) design-based learning, and 5) creative-based learning. Students also shared learning experiences in the instructional media production course that they produced the instructional media based on ADDIE, project-based learning.

3.3 The Teaching Techniques and Methods Used for Instructional Strategies

The findings showed teaching techniques and methods were crucial to encourage students. Experts shared teaching experiences in instructional media production courses. They explained that teachers should design diverse teaching techniques and methods to support the different learning styles. The teaching techniques and methods used for instructional strategies are as follows:

1) Case study that can help students understand educational media production in systematic ways and examples of educational media.

2) Best practice, creative practice that can illustrate students understand the processes of educational media production and how to integrate creative ideas in practice.

3) Questions that encourage students to think systematically such as 5W1H. Challenging questions to motivate students to think creatively.

4) Classroom discussion, brainstorming, and team-based/group work that support students to open minds, reflect on ideas, share opinions, and experiences, and collaborate. The teacher's role should provide positive feedback regularly. It may challenge students with games or competition activities and provide rewards in the different challenge levels.

5) The real situation, and field trip study that let students think, and design educational media in a real situation. They can study and have the experience of seeing and touching real media.

Students also shared learning experiences in instructional media production courses that they need to have

knowledge and understand the core contents of educational media production and how to think systematically to produce educational media effectively. Teaching techniques could be 2 parts; 1) Lecture techniques and demonstration techniques and 2) Practice of instructional media production

3.4 The Learning Activities Which Stimulate and Motivate Learners to Produce Educational Media Systematically

The findings showed that learning activities which stimulate and motivate learners. Experts shared teaching experiences in instructional media production courses. Learning activities should be organized to encourage students with active learning, and creative knowledge, to create instructional media systematically. Moreover, learning engagement was crucial to completing all systematic processes of instructional media production. Social media and immediate feedback could engage students efficiently.

Nowadays, learning behaviors have been changed. Students also explained that they like to learn with mobile devices, online tools, new platforms, and social media. They can learn anytime anywhere engage in learning activities, enjoy learning with peers, discuss, and brainstorm with peers, and work on projects collaboratively.

3.5 The Learning Resources Which Stimulate and Motivate Learners to Produce Educational Media Systematically

The findings showed that the learning resources stimulate and motivate learners to produce educational media systematically. Experts explained online tools and new technology could be active learning tools and motivate learners to create new media. Social media could engage undergraduate students efficiently. The Facebook platform has been a good communication channel to communicate, educate, and advise between teachers and students easily.

3.6 Evaluations of Educational Media Systematically

Experts explained systematic media evaluations should be evaluated based on the design and production processes. Evaluate the accuracy of content and content presentation techniques and media design and production that demonstrate the educational media's quality. Including, the results of educational media that have been designed and produced to evaluate their effectiveness and evaluated by experts, and trial with the target students specified in the production of educational media.

Tools and methods for evaluating media, such as

1) Quality assessments: Create assessments that may be scoring rubrics to help users evaluate the quality of educational media according to established standards such as accuracy, understanding, interestingness, clarity, etc.

2) The Rating Scale: It has 5 levels of evaluation and is assessed by the experts, instructor, peers, and oneself.

3) Expert quality report: Compilation of opinions and reviews from experts about evaluating the quality of media from an academic perspective and real experience.

4) Focus group interviews: Interview a group of target users to obtain qualitative information about the effectiveness and efficiency of the media.

5) The 360-degree assessment: It should be used by specifying indicators and comprehensive evaluation criteria objectives of creating media, availability of equipment or device, production process and efficiency and effectiveness of media, etc.

6) Tracking usage results: Use tracking tools like Google Analytics to collect information about media usage such as number of visitors, time spent, etc.

7) Creating a learning testing process: Use tests or assessments that help learners test their knowledge, understanding, and skills gained from the media.

Most assessment criteria are based on established objectives and evidence. It can set criteria according to academic standards or create specific criteria to match your media and target audience.

Students also shared the evaluation framework as follows;

1) Teachers who are coaches to advise in class and evaluate accuracy and suitability in designing and developing educational media.

2) Classmates who are in the group evaluate other classmate's groups in the trial class.

3) Experts who evaluate the accuracy and suitability of educational media.

4) User's evaluation and trial to improve and revise educational media

3.7 Factors Contributing Learners to Produce Systematic Educational Media.

Experts shared factors that enable students to produce media systematically. The crucial factors consist of 1) strategies or teaching techniques that allow students to practice designing and producing media systematically. 2) teachers who have producing media experience, providing step-by-step instructions in detail, and encouraging students to think analytically, practice, and creativity. 3) students' previous experiences. Teachers should encourage students to be active learners 4) good role models or examples of diverse work. 5) materials, equipment, and supporting tools for students to practice, studio rooms, and filming equipment. Including, various training software and programs that promote the design and creation of educational media. 6) learning environments 7) the work process in clear steps, working duration in each step, follow-up, and teacher feedback.8) personnel or staff support who have experience and can recommend and transfer techniques, experiences, and teach students advanced techniques, and 9) budget.

Students also shared factors that support them to produce media systematically as follows; 1) good role models or examples of various works 2) materials and equipment 3) the learning environment such as the working space 4) teachers who are coaches always available to give advice 5) budget.

3.8 Limitations to Produce Systematic Educational Media

Experts shared limitations in the production of educational media as follows; 1) teachers lack systematic instructional design skills. Therefore, designing teaching and learning activities that are not systematic, and not coherent. This causes students to have too much workload and not be able to connect ideas. Teachers should assign tasks and work as a team. In addition, teachers' media production skills. 2) students' educational media design concepts are limited traditionally based on the examples of teachers' shows and teaching. 3) The time duration of practice is limited which is the main constraint on students' practice. 4) budget.

Students also shared limitations to producing media systematically as follows; 1) students' limited media production skills 2) time-limited 3) budget-limited.

4. Discussion

The findings revealed as follows:

1) The findings revealed the characteristics of instructional media nowadays. Experts explained that the important characteristics of instructional media are that educational media should accomplish the objectives and learning outcomes set. It is well designed and suitable for the learners, age range, characteristics, and learning styles of learners and also could transfer content to understand easily. These results are similar to the process of educational communication that conveys content related to teaching from sender to receiver through media or channels. It causes recipients to change their behavior according to the sender's objectives. Educational communication is important in transferring information, news, knowledge, skills, and attitudes between learners and teachers. The success of teaching and learning in communication for transferring information, knowledge, skills, and attitudes between students and teachers. It can be considered the learners' behavior that has been changed according to the goals set at the beginning (Topothai, 2019). There are two main popular instructional media types as follows; 1.1) digital media and 1.2) handmade media. Nowadays, teachers need to consider the school context because they need to teach both online and classroom to accomplish the learning objectives enhance and 21st-century learning skills. Bunmee (2021) explained that teachers must innovate media to use in teaching and learning and stimulate students' developing learning skills in the 21st century in 3 areas: learning skills and innovation, information, media and technology skills, and life and career skills

2) The findings revealed that instructional strategies support the production of educational media systematically. Experts explained these instructional strategies should focus on a system approach. These results are similar to Collins and O'Brien (2011), who stated that instructional strategies refer to all the processes planned to be used in teaching and to achieve specific goals and teaching objectives. Instructional strategies are ways in which teachers can help each learner learn according to his or her ability to achieve each objective. The goal of the strategy is to guide teaching and learning activities that are consistent with achieving all objectives. The success of the strategy is the principles and materials used in presentations to create the most learning experience by all planning and effective use, systematization of principles, effective techniques, and information. The Royal Institute (2012) explained that teaching and learning strategies or teaching strategies or instructional strategy is a concept, approach, method, or main path that leads to organizing the teaching and learning process and measurement and evaluation of learning outcomes. This is derived from student analysis of learning goals, learning content, and the learning context, including the context, conditions, and limitations of the instructor, and

selecting principles, concepts, and methods to lead students to complete the desired goals. Planning teaching strategies gives importance to learners and teachers simultaneously.

The instructional strategies that support the production of educational media systematically are as follows: 1) ADDIE includes five steps; analysis, design, development, implementation, and evaluation. 2) 3P that included three steps; pre-production, production, post-production 3) project-based learning 4) design-based learning, and 5) creative-based learning. Students also shared learning experiences in the instructional media production course that they produced the instructional media based on ADDIE, project-based learning. Instructional design promotes the production of systematic educational media for higher education students and it would affect the student's development to have the ability to systematically design and develop educational media. These results are similar to Kurt (2018) has described the ADDIE Model in teaching and learning design. Instructional design that educators and instructional designers use ADDIE Instructional Design (ID) as a framework for designing and developing educational and training programs. As an instructional design model, the ADDIE Model has found wide acceptance and use for many years. The related documents on the design and development of educational technology and communications showed that the ADDIE Model is the most applied for designing and developing teaching and learning and designing and developing teaching media. As Kanjak (2016) explained, an important practice in the field of educational technology is instructional design. ADDIE is an instructional design system used by developers of media and instructional technology. The ADDIE design methodology can help teaching materials developers, developers in other fields, and teachers at the school level to design effective instruction. Nowadays, ADDIE components have been applied to create and develop products for both online teaching and face-to-face teaching in the classroom. Khlaisang and Koraneekit (2016) also used the principles of the ADDIE instructional design model to design and develop websites for teaching and learning. Therefore, the researcher used ADDIE principles as principles to encourage students to design and develop educational media systematically. Moreover, previous research showed instructional media production based on ADDIE has been effective as Ananpatiwet, Tubtimtong and Cinmuk (2021) developed video media based on the ADDIE model on nursing care for high-risk preterm infants. In conclusion, the developed VDO is an efficient teaching medium. Teachers can use it as teaching material, and students can use it for self-learning outside the classroom and it would affect the development of knowledge for students. Chabudboontarik, Suracitto, Rinrit, Namseethan and Chatree Pengtham (2022) developed the digital media on world regions and historical development, based on the ADDIE Model, for Mathayomsuksa 3 students. The experts evaluated these digital media that was at a high, and the efficiency of these digital media was higher than the standard criteria. The learner's achievement after learning was higher than before learning. Bulkani., Fatchurahman, Adella and Setiawan (2022) developed animation learning media based on local wisdom to improve student learning outcomes in elementary schools. The researchers conducted development research with the ADDIE model to produce this media, which consisted of the analysis, design, development, implementation, and evaluation stages. The results showed that the post-test score was greater than the pre-test. Therefore, it can be said that the designed model is effective in improving learning outcomes. Therefore, ADDIE could be the main guideline instruction for educational media production systematically. Moreover, 3P which also supports the production of educational media systematically includes three steps; pre-production, production, and post-production. Phakdeepattanakun and Sinjindawong (2022) designed active learning activity for promoting content writing skills in video microlearning media. They organized the principles of 3P video media creation on learning activities. The results found that the participants were able to create video micro-learning media higher than standard and the participants in the activities were able to improve their content writing skills. Ayuwong, Saraboon and Tungsathitkul (2023) developed digital video production using storytelling of the death railway. They designed on 3P process and storytelling was applied for video media production. The results showed that the quality evaluation of the digital video using storytelling was at a high level. Kaewchanpech1, Khinhom and Sudsanguan (2023) developed video media with B-Roll filming techniques. They designed the 3P process of media production. The quality assessment results by experts in video production techniques were very good. Therefore, the 3P process of media production could also support educational media production systematically.

3) The findings showed teaching techniques and methods were crucial to encourage students. Experts shared teaching experiences in instructional media production courses. They explained that teachers should design diverse teaching techniques and methods to support the different learning styles. These results are similar to Khammanee (2019) stated that teaching techniques refer to various strategies used to enhance any process, procedure, method, or action to help the process, steps, methods, or actions more quality and efficiency.

The teaching techniques and methods used for instructional strategies are as follows: 1) Case study 2) Best practice, creative practice 3) Questions 4) Classroom discussion, brainstorming, and team-based/group work 5)

The real situation, and field trip study. These results are similar to Khammanee (2019) explained that organizing teaching and learning by using the learner as the center or student-centered instruction is a teaching and learning arrangement that focuses on the learner. Taking into account the appropriateness of the learner and the maximum benefit that the learner should receive. Learning activities are organized that allow students to play an important role in learning. Participated in active learning activities and used various learning processes which will lead students to learning truly by using learning management according to actual conditions. It is an operation that helps students learn by allowing students to face real situations, and real problems in real contexts and study and learn together. Seek knowledge, various information, and methods to solve that problem and receive evaluation results according to real-life quality standards. The techniques and teaching methods are self-directed learning, self-learning, etc. Bunmee (2021) explained that in organizing learning in the 21st century, the teaching materials and activities that help students develop such 21st-century skills include excursions, hands-on work through project work, activities, exhibitions, experiments, group work, and social media. The media and management of these teaching and learning will help students to do real activities, try to do what they think through projects, collaborate with others through a group process, go out to find experiences from outside learning sources, and exhibit their works. These help students achieve clear learning, experience, and their specific skills. They can apply the knowledge gained from learning to apply and further develop their career in the future. Moreover, the teaching techniques and methods that collaborate students with peers are also active activities to communicate and stimulate learning, students will learn together and continue to design and develop educational media throughout the semester, such as questions, brainstorming, and discussions (Khammanee, 2023; Seechaliao, 2017; Wongyai & Patphol, 2021). These results are similar to how education in the 21st century responds to current and future world development. Education emphasizes learning management and focuses on students who promote and support students to create new knowledge and innovations according to their interests, abilities, and aptitudes. Students need to think and work collaboratively (Pundhitamethee, Boonpoo, & Chaisuk, 2022).

4) The findings showed that learning activities which stimulate and motivate learners. Experts shared teaching experiences in instructional media production courses. Learning activities should be organized to encourage students with active learning, and creative knowledge, to create instructional media systematically. Moreover, learning engagement was crucial to completing all systematic processes of instructional media production. Social media and immediate feedback could engage students efficiently. These results are similar to Bunmee (2021) explained that teachers have to innovate media used in teaching and learning to stimulate students' developing learning skills in the 21st century in 3 areas: learning skills and innovation, information, media and technology skills, and life and career skills. Therefore, teachers need well-organized learning activities and know the suitable social media to engage their students efficiently. Pundhitamethee, Boonpoo and Chaisuk (2022) studied the guidelines for developing student learning in the 21st century during the COVID-19 situation. They found that is good to take advantage of technology to allow students have interact and participate in learning. Distinguish appropriate information and be able to apply the gained knowledge concretely. Niamsuwan (2021) studied teaching and learning management to enhance learning skills in the 21st century in a new way of life. She found that in learning to acquire skills in the 21st century, active learning should be promoted rather than passive learning. Active learning cannot occur directly from the teacher but it will require lots of cooperation from the students. Senawong (2021) studied the behavior of Generation Z's social media in the new normal era in Bangkok. She found that Generation Z people think that social media helps them get information quickly. Social media is the online community that they choose to use as modern media and social media reduces spending time on communication and search for various information. Most of them have a frequency of entry and spend time on social media 10 or more times/day. The average time to continue using social media is 7 hours or more per day. Wongjinda and Udomsri (2022) studied the behavior of undergraduate students and social media literacy skills. The results showed the behavior of undergraduate students was at a very high level that the average time spent was more than 3 hours, period 4.00 pm–00.00 am. The social network that was mostly used was Facebook for entertainment and student's social media literacy skill were at a very high level. Thamaduengsri (2021) studied behaviors in accessing social media of university students. The results of the study 1) indicate that most students access social media more than once a day; most of the participants access the media for longer than 3 hours; most of them access social media at night. They access the media at home or in a dormitory. Smartphones are used as access devices. Facebook is the most popular platform. 2) The students were affected by social media at an average level in terms of education, family, society, and emotion.

5) The findings showed that the learning resources stimulate and motivate learners to produce educational media systematically. Experts explained online tools and new technology could be active learning tools and motivate learners to create new media. Social media could engage undergraduate students efficiently. The Facebook

platform has been a good communication channel to communicate, educate, and advise between teachers and students easily. These results are similar to Topothai (2019) described that media or channels cause the recipient to change their behavior according to the sender's objectives and educational communication is important in transferring information, news, knowledge, skills, and attitudes between learners and teachers. These results are similar to Netwong (2019) studied relationships in the teaching and learning processes, digital technology supports learning and digital literacy processes. She explained that digital technology for support learning were as 1) Blog 2) e-Portfolio 3) Facebook 4) Google 5) Google Form 6) Related databases 7) Search Engine 8) Website 9) Wikipedia 10) YouTube. Roobyai (2021) studied online social media usage behavior with learning in the 21st century of undergraduate students. The results found that they used smartphones as a channel for receiving online social media. Facebook was the most popular social media. The objective of using Facebook was for communication. The time spent using online social media was more than 6 hours per day, and the most frequent period was 18:01–24:00. The utilization using online social media was at a high level. The students used online social media for communicating and working with their friends comfortably at the highest level, watching movies, listening to music, playing games, following news and events, relaxing, searching for goods easily and comfortably, seeking more knowledge, presenting works and ideas, respectively. Bunchongkien (2023) studied the information and social media usage behavior of undergraduate students. The results showed that: 1) social media usage behavior of students included YouTube, Instagram, Facebook, and Line respectively; and the objectives of social media usage included entertainment, chatting with friends, and learning and research respectively. 2) Students' satisfaction towards information sources and social media was summarized as follows: 1) information sources included websites, book shops, people sources, and libraries respectively; and social media included YouTube, TikTok, Instagram, Twitter, Facebook, and Line respectively. Phaomanacharoen, Yongsorn and Ponathong (2018) also studied the social media literacy of undergraduates in autonomous higher education institutions in Bangkok. They found that undergraduates have social media literacy consisting of 1) awareness of the effects of social media 2) verification accuracy of social media 3) differentiation of information available in social media 4) analyze social media communication techniques 5) contribution to social media through information gathering 6) know the meaning of symbols used in social media 7) appraise social media's values 8) select information on social media, and 9) use social media as a domain for creative works. Therefore, teachers could integrate social media into the classroom.

6) Experts explained systematic media evaluations should be evaluated based on the design and production processes. Evaluate the accuracy of content and content presentation techniques and media design and production that demonstrate the educational media's quality. Including, the results of educational media that have been designed and produced to evaluate their effectiveness and evaluated by experts, and trial with the target students specified in the production of educational media. These results are similar to Mingsiritham (2016) explained that the purpose of the evaluation is to improve and develop the quality of the teaching media to make the students change their behavior according to the objectives of learning the subject. Therefore, the evaluation of the teaching media is an evaluation to improve the quality of media to be appropriate for the group of learners. Evaluations the teaching media quality are divided into 2 main parts: 1) Evaluation of the internal structure of the media as follows; 1.1) Characteristics of teaching media 1.2) Design Standards, and 2) Evaluation of media quality or qualitative. Kanjug (2016). explained that quality evaluation of the product such as media. Experts usually review the crucial parts as follows: 1) content 2) design 3) media 4) evaluation. Tianbanjong et al., (2001) explained the evaluation of the media quality as multimedia. There is often additional usually consider three important parts: 1) instructional design, 2) screen design, and 3) usability

Tools and methods for evaluating media, such as 1) Quality assessments/evaluation 2) The rating scale and rubric 3) Expert quality report 4) Focus group interviews 5) The 360 degrees assessment 6) Tracking usage results 7) Creating a learning testing process. These results are similar to Kanjug (2016). explained that tools and methods for evaluating products such as media could be evaluated as follows; 1) Evaluation 2) Testing 3) Expert review 4) In-depth interview 5) survey. Phothong (2018) also described that the media evaluation tool uses a rating scale by experts. Tianbanjong et al. (2001) explained tools and methods for evaluating media that conduct media experiments with representatives of target groups in real situations. Additionally, previous research always showed expert quality reports. The expert evaluated the instructional media through quality assessments, quality evaluation, the rating scale, and focus group interviews (Ananpatiwet, Tubtimtong, & Cinmuk, 2021; Chabudboontarik, Suracitto, Rinrit, Namseethan, & Pengtham, 2022).

7) Experts shared factors that enable students to produce media systematically. The crucial factors consist of 1) strategies or teaching techniques 2) teachers' role 3) students' previous experiences 4) good role models or examples of diverse work. 5) materials, equipment, and supporting tools 6) learning environments 7) the work

process 8) personnel or staff support, and 9) budget. Students also shared factors that support them to produce media systematically as follows; 1) good role models or examples of various works 2) materials and equipment 3) the learning environment 4) teachers' role 5) budget. These results are new findings.

8) Experts shared limitations in the production of educational media as follows; 1) teachers lack systematic instructional design skills. 2) students' educational media design concepts are limited 3) The time duration of practice is limited 4) budget. Students also shared limitations to producing media systematically as follows; 1) students' limited media production skills 2) time-limited 3) budget-limited. Therefore, it is necessary to design teaching and learning in real contexts. These results are similar to Khaemmanee (2023) explained if the teacher still does not understand the subject taught teach that matter to others to understand. It may not be possible or difficult. Therefore, knowledge and understanding of the subject taught including strategies or teaching methods that are appropriate to the nature of what is being taught are important. Teachers need to have enough knowledge and understanding of the subject. Teachers should also have knowledge and understanding of teaching strategies or methods that are appropriate to the nature of what is being taught. It is to make teaching and learning more efficient. Facilitates students to learn, practice thinking processes, and be able to design and develop teaching media to the fullest extent of their abilities.

5. Conclusion

Nowadays, instructional media is crucial to helping learners to obtain learning objectives in a shorter time but it also depends on the use of instructional media in the actual context. There are two main popular instructional media types as follows; 1) digital media and 2) handmade media. Producing educational media systematically is important to producing instructional media quality, it could be used in the actual context effectively. The instructional strategies to produce educational media systematically are as follows: 1) ADDIE includes analysis, design, development, implementation, and evaluation. 2) 3P included pre-production, production, post-production 3) project-based learning 4) design-based learning, and 5) creative-based learning. Teaching techniques and methods encourage students such as case studies, best practice, creative practice, questions, classroom discussion, brainstorming, team-based/group work, the real situation, and field trip study. Organized activities to encourage students with active learning, and creative knowledge, and create instructional media systematically. Online tools and new technology could be active learning tools and motivate learners to create new media. Moreover, learning engagement, social media, and immediate feedback could engage students efficiently. Systematic media evaluations should be evaluated based on the design, production processes, and results. However, the crucial factors consist of 1) strategies or teaching techniques 2) teachers 3) students 5) materials, equipment, and supporting tools 6) learning environments 7) the work process. The limitations are as follows; 1) teachers 2) students 3) time 4) budget. These all factors and limitations need to be taken into consideration in the media production processes.

Authors contributions

I conducted this research, drafted, and revised the manuscript, and also the correspondence to read and approve the final manuscript.

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No additional data are available.

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