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Research Article

**USE OF PEYTONS FOUR STEP APPROACH AND GAGNES
MODEL IN TEACHING MICROSCOPY****Dr. Tahir Mehmood, Dr. Rabiya Farrukh, Dr. Kokab Saleem**
Bahawal Victoria Hospital, Bahawalpur**Abstract:**

Objective: The objective of the research was to design a lesson plan for the teaching microscopy by making use of combined Gagne's & Peyton's model.

Study Design: It was a qualitative research with a scoping review.

Place and Duration of Study: The study was conducted in Allied Hospital Faisalabad from January 18 to June, 18.

Material and Methods: To identify the relevant articles by using an exclusion & inclusion criteria and for making lesson plan for improving psychomotor skill was the purpose of study. After selecting articles, evidence was created in which name of author, limitations of study, country, publication year, main findings & model used for making lesson plan were included. Lesson plan was made on microscopy by this synthesised evidence. No quantitative software or analysis was used as this was a qualitative research with scoping review.

Results: Out of total 130 selected articles, only five articles were selected after screening & assessment for eligibility. The evidence suggests that 4 articles had applied (Gagne's model) & only 1 article applied combined Peyton's & Gagne's model for designing lesson to convey (psychomotor skills). On microscopy, we applied combined model for designing lesson plan for students of pathology. Various parts were made of microscopy skill & every learning step was united in 9 events of (Gagne's model). To teach real microscopy skill, (Peyton's model) was used for good executing & learning.

Conclusion: The Gagne's & Peyton's model was combined for designing a better lesson plan for teaching microscopy. For many other psychomotor skills, this model could also assist for delivering much better sessions of teaching.

Keywords: Peyton, Pathology, Microscopy, Learning. Educational Models.

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INTRODUCTION:

For teaching & learning pathology, microscopy is basic. This skill is inevitable & must be mastered by (post-graduate residents in pathology in training), students of microbiology, (medical laboratory technology students) & all under-graduate medical students. From surgical specimens, the tissue-based diagnosis is even now a gold standard in (diagnostic pathology). It is highly reliable technique in tissue-based identification practice having greater specificity & sensitivity [1].

With various platform, microscopy can carry out like multi-head microscopes, fluorescent & compound microscopes which is usually practiced in (pathology laboratories). While for diagnosing surgical specimens, (virtual microscopy) is used and it has been used as (research tool). Moreover, it has also been followed for (assessment strategies in pathology). Because of easy handling & interpretation, this microscopy is used in (pathology laboratories) for research and diagnosis [2].

To make lesson plans for psychomotor skill, there is evidence in literature but there is short data for making lesson plan. Moreover, (focused reviews) on available evidence for making (instructional models) of lesson plans are limited too. This research is qualitative with the aim of scoping review. It is to assist in lesson plan for teaching microscopy with (Gagne's) 9 events of instruction & (Peyton's) 4 step method. While, (Gagne's) 9 events model is a series of 9 steps which help for teaching. It can be applied for teaching (psychomotor skills) like microscopy. Moreover, it has been applied for (slit lamp examination) teaching & also phlebotomy [3]. The model of Peyton comprises four steps for teaching psychomotor skill as demonstration, deconstruction, explanation & performance and also in teaching other skills. To make a plan using combined Gagne's & Peyton's model is the aim of this study.

MATERIAL AND METHODS:

The study was conducted from January, 18 to June, 18 at allied hospital Faisalabad. We studied various research techniques by various terms as in table - 1. Terms were like gagne, peyton, lesson, skill, medic, education, learning & learn. Criteria for inclusion was an article that has applied Peyton's 4 & or Gagne's 9 steps model for making lesson plan to teach (psychomotor skill) for medical profession. The

articles underwent identification & final inclusion through 5 steps in which (applying search strategies), identification, screening, (assessment for eligibility) & ultimate selection of articles. Following was exclusion criteria: articles other than medical education, in language other than English & those with assessment of procedural skill in an (analytical study).

Then evidence from finally selected articles was created on many parameters in which limitation of study, model used for lesson plan, key findings, name of author, publication year & publication country were included. After it, from (synthesised evidence) lesson plan was made for (psychomotor skill). Educational theories & variety of learning styles were linked with every step of lesson plan. The ethics board of University approved the study. It is a qualitative study for a (scoping review) so there is not any (quantitative analysis).

RESULTS:

130 articles were identified after applying research techniques. Then abstracts & titles were studied and screened for three things: eligibility then applied both exclusion & inclusion criteria. For scoping review, 5 articles were selected & gone through their complete text, details are shown in table - 1. The evidence shows that 1 article used combined Peyton & Gagne's model for lesson plan for (slit-lamp examination in ophthalmology) and 4 articles used Gagne's 9 steps model for lesson plan of psychomotor skill in which phlebotomy, ascetic drain, bone marrow aspiration & chest x-ray interpretation.

Major drawback of articles was lack of discussion for linking of Gagne's model with (educational theories) & various styles of learning. For making lesson plan, a combined model of (Ng et al) as theory-based from scoping review on microscopy for pathology learners with following description: the focus of the paper is microscopy skills which are actually (psychomotor skills) & students were motivated to go through some areas before going for microscopy study like vessels, nerves, muscles, stroma, basement membrane, structures of epithelium & basic design of microscope. They must also read few common histopathology like (colon carcinoma) & histology like (normal colon) to enable them learn efficiently.

Table: Search strategy used for identification, screening and inclusion of relevant articles

Search Strategy	Number of Article Retrieved
Search (((Peyton*) AND Skill*)) AND Lesson* Sort by: Title	1
Search (Peyton*) AND Skill* Sort by: Title	20
Search (((Gagne*) AND Skill*)) AND Medic*) AND Education* Sort by: Title	8
Search (((Gagne*) AND Skill*)) AND Peyton* Sort by: Title	1
Search (((Gagne*) AND Skill*)) AND Learning* Sort by: Title	18
Search (((Gagne*) AND Skill*)) AND Learn* Sort by: Title	20
Search (((Gagne*) AND Skill*)) AND Lesson* Sort by: Title	5
Search (Gagne*) AND Skill* Sort by: Title	57
Total	130

The under mentioned details describe each of 9 events of Gagne's model:

Gaining Attention

This is done to improve learning & for motivating students following activities could be conducted: The Nobel laureates in the field of medicine & physiology must be shown with microscope. It must be informed clearly that their (Nobel Prize) is due to taking interest in using microscope for biology. Some conceptual questions must be asked for introduction like: How can we calculate size using microscope of an (intestinal villous)? Under microscope, can we identify (tumour cells invading) any vessel? You can show them any video clip in pathologists are busy in using microscope in live situations [4].

Informing learners of Objectives

Learning outcomes must be defined at initial stage and they must be attainable, measurable, realistic & clear. It will show that purpose of both the students & session is aligned. Objectives must be like after this session student will be able to

- Manoeuvre a standard microscope
- Calculate size of intestinal villous
- Recognize goblet cell in (intestinal mucosa)
- Check usual intestinal mucosa & contrast with (unusual mucosa)
- Recognize vascular invasion in (carcinoma slide)

The above mentioned outcomes might help in ignoring or paying real focus to some of outcomes. To ease learning, the objectives are presented in a sequence. Student's competencies may be different in many sessions.

Stimulate Recall of Prior Learning

If they construct their learning based on experience & prior knowledge, adults may learn better. It can be facilitated by focused (group discussion) on past skill

& microscopy concepts which students have in

school & medical college education. In pathology check-up, students will be inquired the importance of microscopy skills to improve this process.

To demonstrate various parts of cellular architecture & tissue to students, simulation i.e. (virtual dynamic image) would be used. It will help students in recognition things mentioned in outcomes 1-5 above.

Presenting the Stimulus

Before session, a pattern of events included in microscopy will be given to learners as in objective-1. A fully briefed PPT lecture of various steps of microscopy will be provided & followed by examples of (histology) & (histopathology) as in objectives no. 2, 3, 4 & 5. It will assist students in relating various events involved in (microscopy) like use of (adjustments knobs) & (objective lens) etc. For teaching real skills based on (Peyton model), teacher will show microscopy gradually like role-playing & simulation by pathologists performing normally without any explanation as in Peyton step-1.

Providing Learning Guidance

The student-centred teaching would be started by discussion on functions & parts of (microscope) with explaining pathology slides. Teacher will review checking of slide using microscope by describing every event with tips from experience as in (Peyton step-2). Students will be motivated to ask any confusing point. Then students will themselves demonstrate every (microscopy step) & teacher will also follow it as in Peyton step-3.

Eliciting Performance

The best phrase for this step is (learning by doing) &

enough time will be given to it. To perform (autonomous microscopy), students will be motivated as (Peyton step-4) by giving microscope with slide to every student & asked for examining cellular architecture & tissues. It will ensure good learning (laboratory environment) for better teaching.

Providing Feedback

In the examination of (slide session), teacher will go close & guide by taking feedback of students. Teacher will motivate students for clarifying their concepts & give tips in each (microscopy session). The students will be given feedback on slide details with sequential use of (objective lens), knob adjustment, identifying required structure & slit lights. This feedback may be given by (Agenda-Led Outcome-Based Analysis) model.

Assessing Performance

The performance under guidance of (microscopy skill) has now enabled students with encouragement & confidence to execute the process individually. Using a pre-decided checklist, teacher will take (formative assessment) of students for their practical use of microscope with demonstration of slides. It will be compared then with self-evaluation done on the part of students.

Enhancing Retention and Transfer

Now students will be given a slide of patient other than they are already working on & asked to recognize a (pathological state) with microscope. Students will feel confident to share their knowledge to fellow students by interacting them in peers. It will be concluded by looking into the outcomes either achieved or not. After it, a question & answer session will be held to ensure the required learning of students. Some resources & reading materials will be given to students after they have evaluated this session. The (microscopy) will be at core of (pathology) & students will be motivated to perform & improve microscopy skills regularly.

Simulation and Role Play

It could prove an efficient teaching & learning technique for teaching pathology. At Gagne's step 3, 5, 6 & 8 role play & simulation can be effective. Moreover, two disciplines as (digital pathology) & (microscopy) are there that may give good (simulation) of practical (pathology reporting).

DISCUSSION:

In pathology, our research has dealt a deficient education of medical by making lesson plan of microscopy with scoping review with the help of qualitative study. A combined model was selected

which was then employed for (theoretical framework) of this research [5]. It was tried to make it appear new in ensuing briefing to relate this model to (educational theories). Students were given variety of styles of learning. For Gagne's step one, suitable learning styles are auditory & visual. There must be brain storming sessions & enjoyable challenging tasks like Nobel [6].

Laureate pictures & questions. So the reflectors are best observers & learn more by appreciation during (learning process) like a video of a (pathology laboratory). Through discussion & imagery as educational theories, in the mind of learner there is cognitivism i.e [7]. (cognitive information processing). Learners with best social, auditory, logical & visual styles are those which suit (Gagne's step-2). The outcomes follow one another in which students are involved individually & in groups. Students will be prepared well for upcoming steps by +ve reinforcement & behaviour-based approach by motivating them with 'good job done' etc [8]. For Gagne's step-3, learning styles are that it has an ability of engaging linguistic, kinaesthetic, visual & both intra & (inter-personal intelligences) i.e. Multiple Intelligence Theories. It includes (constructivist learning theory) [9]. For (Gagne's event-4), learning styles are that it will lead to linguistic, auditory, visual & (inter-personal intelligences). The educational view relation is the (schema of microscopy) followed by PP slides & practical view of microscopy will include (cognitivism) & (sequential constructivism) [7].

Styles suitable for (Gagne's event-5) are their comprehension stage that permit interpersonal learning, kinaesthetic & (stimulation of linguistic) styles in students. It will allow reflectors to know more so that they may better admire & understand the perspectives of performer. Its educational link is the (interactivity) & (practical demonstration) by students [10]. It is encoding of memory by (cognitivism) & a level of (sequential constructivism). Gagne's step-6 has learning styles allowing stimulation of kinaesthetic, logical, linguistic, visual, spatial & (intra-personal) solitary in students. The (pragmatist students) are permitted themselves to try methods of (microscopy). This stage is a combination of learning theories like constructivist, cognitivist & (experiential learning theory) [11].

Gagne's step-7 has styles allowing stimulation of kinaesthetic, linguistic, visual, logical, & both inter-personal & intra-personal learning styles of students. All the theorists doing analysis will be benefitted out

of this session. This stage has a part of behaviourism as the teacher goes around & motivate students.

Students take feedback from their facilitator & show it in (microscopy) i.e [12]. cognitivism. Those processes of learning for cognitivism & behaviourism shown here are linear. Then this feedback finally results in continuous learning by (meta-cognitivism) & (self-regulated learning). For (Gagne's step-8), learning styles are anticipated to give students the skills of solitary, kinaesthetic, logical, visual [13].

All the activists & theorists enjoying challenges & analysis will learn from it. In education theory, cognitive, experiential & (constructivist theories) describe better this stage of (microscopy skills). (Gagne's step-9), has learning styles to give students logical, solitary, visual, kinaesthetic & (social intelligences). It is challenging session for (pragmatists), so they will enjoy it [14]. The relation of (educational theory) is (social-constructivism) which may describe this stage. Students are provided the chance to learn by (peer interaction) & (collaboration) and building their skill i.e. constructivism on knowledge which they already have [15].

Every stage of microscopy was carefully planned by using (Gagne's) & (Peyton's) models. For students of pathology, a lesson plan was made to cover learning needs along with variety of (learning styles). The relation of (combined model) with various (learning styles) & (educational theories) will implement good understanding & model's application.

CONCLUSION:

This qualitative research of (scoping review approach) has been adopted for identifying much better model for teaching (psychomotor skills). By combining the Peyton's four & Gagne's nine steps approach has helped for designing a better lesson plan for teaching (microscopy skill) efficiently in pathology.

REFERENCES:

1. Ng, J.Y., Combining Peyton's four-step approach and Gagne's instructional model in teaching slit-lamp examination. *Perspectives on medical education*, 2014. 3(6): p. 480-485.
2. Ali, A., et al., Teaching Microscopy Effectively Through A Combined Peyton's Four-Step Approach And Gagne's Instructional Model. *Pakistan Armed Forces Medical Journal*, 2017(6): p. 1030-1037.
3. Woo, W.H., Using Gagne's instructional model in phlebotomy education. *Advances in medical education and practice*, 2016. 7: p. 511.
4. Wong, Y.L., Utilizing the principles of Gagne's nine events of instruction in the teaching of Goldmann Applanation Tonometry. *Advances in medical education and practice*, 2018. 9: p. 45.
5. Succar, T., et al., A systematic review of best practices in teaching ophthalmology to medical students. *Survey of ophthalmology*, 2016. 61(1): p. 83-94.
6. Rajaratnam, V. and T. Pei-Yein, Using Instructional Design Principles in Developing Skill Acquisition Workshops in Hand Surgery: Our Experience. *International Journal of Excellence in Education*, 2015. 184(3314): p. 1-7.
7. Riskin, A., et al., 'Becoming a Physician'—medical students get acquainted with disadvantaged populations, and practise sensitive and effective communication. *Perspectives on medical education*, 2015. 4(6): p. 339-343.
8. Metalious, G., *Retour à Peyton Place*. 2016: Presses de la Cité.
9. Cheung, L., Using an Instructional Design Model to Teach Medical Procedures. *Medical science educator*, 2016. 26(1): p. 175-180.
10. Balakrishnan, S.K., Effect of discourse oriented pedagogy on acquisition of English language skills among upper primary students of Kerala. 2014.
11. Williams, M.E., A phenomenological exploration of the perceptions of gifted adolescents coping with stress. 2015: Lamar University-Beaumont.
12. Syah, F.K., Hubungan Antara Motivasi Akademik Ekstrinsik Dan Self Directed Learning Readiness Pada Mahasiswa Program Studi Kedokteran Fakultas Kedokteran Universitas Sebelas Maret. 2014.
13. Metalious, G., *Peyton place*. 2015: Presses de la Cité.
14. Ordi, O., et al., Virtual microscopy in the undergraduate teaching of pathology. *Journal of pathology informatics*, 2015. 6.
15. Storksdieck, M., Using Microscopy for Authentic Science Teaching: A Learning Sciences Perspective. *Microscopy and Microanalysis*, 2015. 21(S3): p. 647-648.