

PHYSICAL ACTIVITY AND SPORTS IN EDUCATION SCIENCE

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1. Introduction

Physical education and sports lessons are an indispensable part of primary, secondary and secondary education programs in our country, as in all developed countries. In accordance with the 12-year compulsory education system, "physical education and game" is taught in primary school, and "physical education and sports" in secondary and secondary education. The knowledge dimension of cognitive domain applications within the framework of traditional learning approach; the adoption of affective domain values and the development of social skills; psychomotor domain includes motor skills and physical fitness (Demirci, 2013). There are different areas in physical education teaching according to the taxonomic approach, these are cognitive, affective and psychomotor areas (Huitt, 2011).

2. Cognitive Field

This area is associated with knowledge acquisition and intellectual development. This area consists of the dimensions of knowledge, comprehension, application, analysis, synthesis, and evaluation, respectively (Başaran, 1997; Collier, 1971).

3. Affective Field

Many factors affect an individual's learning, such as feelings about himself, learning experiences, and the subject. This area covers the adoption of values and the development of social skills. It consists of the steps of receiving, reacting, valuing, organizing and personalizing (Bunker & Thorpe, 1982; Fidan, 1992; Erden & Akman, 1996).

4. Psychomotor Field

It includes motor skills and physical fitness. The first goals focus on the development of basic movements and perceptual skills, while the later goals focus on the development of physical fitness and higher-level movement skills.

It consists of the steps of perception, establishment, doing with a guide, mechanization, making it a skill, adaptation, and creation (Çilenti, 1979; Ergin, 1998; Kaya, 2006; Harlow, 1972).

5. Teaching Styles in Physical Education

In addition to the two main styles determined as student and teacher centered, the range of teaching styles developed by Mosston and Ashworth has been used in the field of physical education and sports for 50 years (Mosston and Ashworth, 2002). The fan is as follows;

A	B	C	D	E	F	G	H	I	J
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The spectrum shifts from teacher-centered (A-E) to student-centered (F-J). At the same time, it shifts from imitating and duplicating the movement, that is, from the presentation stage (A-E), to the production of new movement-information, that is, towards the invention stage (F-J). Each style consists of preparation, application and evaluation phases. At the same time, the teaching

behavior learning behavior-goal relationship in the styles A-E tends to the teacher. In the F-J cluster, however, they tend to be students (Chatoupis & Emmanuel, 2003; Mosston & Ashworth, 2002).

Styles A-E contain precise information or sports movements that have no alternative. The F-G cluster represents styles that support exploration, while the H-J cluster includes the development of alternative designs (Griffin et al., 1997; Mosston & Ashworth, 2002; Hellison, 2011).

5.1. Command Style

The teacher is active during the preparation, implementation and evaluation phases. The student puts the given warning into practice directly and immediately. Considerations (Mosston and Ashworth, 2002);

- The subject is fixed, the subject is learned through repetition, the subject should cover a single standard/achievement,
- Individual differences cannot be taken into account
- The tone, clarity, speed of commands are important for the group
- Repeating the same command over and over is tiring
- The teacher makes 9 important decisions
- The teacher is responsible for the consequences of decisions

5.2. Practice Style

The teacher is active in the preparation phase, the student in the implementation phase, and the teacher in the evaluation phase. The teacher should determine the subject and make the evaluation. The student will continue the implementation phase himself. The decisions in the implementation phase belong to the student. However, these decisions are with the teacher during the preparation and evaluation phase. Considerations (Mosston and Ashworth, 2002; Metzler, 1990);

- It is used in learning that is done in a certain order and there are no alternative ways.
- The student can experience the beginning of independence
- Movements must be able to be defined as true or false
- It is necessary to pay attention to the development of the student's decision making.
- The student must be trusted to make 9 important decisions
- Students are responsible for the consequences of decisions

5.3. Pair Working Style

In the preparation phase, the teacher is active, in the implementation phase the student is active, and in the evaluation phase, the observer/partner is active. The teacher determines the subject, while one student practices, the other student evaluates the student who practices according to the criterion paper designed by the teacher (1 peer feedback-1 teacher feedback). At the end of

the application, the roles are repeated by changing. Considerations (Metzler, 2017; Mosston & Ashworth, 2002);

- Develops socialization process
- The active role of the student expands
- Paper consisting of criteria containing the steps of the movement should be used.
- The student must be trusted to make 9 important decisions
- The observer should be trusted to be able to evaluate with the criteria paper
- The student is responsible for the results of the decisions, and the observer is responsible for the results of the evaluation.

5.4. Self-Control Style

The teacher is active in the preparation phase, the student is active in the implementation phase, and the student is active in the evaluation phase. The teacher determines the subject, the student evaluates himself according to the criterion paper designed by the teacher at the same time while he is practicing (1 student feedback-1 teacher feedback).

The decisions in the implementation phase belong to the student. Considerations (Mosston & Ashworth, 2002; Metzler, 2017, Metzler, 1990);

- Develops self-evaluation skills
- The active role of the student expands
- Paper consisting of criteria containing the steps of the movement should be used.
- The student must be trusted to make 9 important decisions
- The student should be trusted to be able to self-assess with the criterion paper
- The student is responsible for the results of the decisions and evaluation

5.5. Participation Style

The teacher is active in the preparation phase, the student is active in the implementation phase, and the student is active in the evaluation phase. It can be used in lessons taught with heterogeneous groups.

The teacher determines the topic and prepares tasks of different difficulty levels. It is left to the student to decide which task will be applied, and the student chooses the appropriate level. The student evaluates himself/herself according to the criteria paper designed by the teacher at the same time while practicing. The decision in the application phase belongs to the student. Considerations (Yavaş and İlhan, 1997; Mosston and Ashworth, 2002; Metzler, 2017, Metzler, 1990);

- Develops self-evaluation skills
- The active role of the student expands
- Paper consisting of criteria containing the steps of the movement should be used.
- The student must be trusted to make 9 important decisions

- The student should be trusted to be able to self-assess with the criterion paper
- The student is responsible for the results of the decisions and evaluation

5.6. Directed Invention Style

In the preparation phase, the teacher is active, in the implementation phase, the teacher-student is active, and in the evaluation phase, the teacher-student is active. In the preparation phase, the teacher makes all the decisions and prepares the questions to guide the student. In the application phase, the student tries to discover the answers and the common result of the answers in accordance with the questions asked. In the exploration process, the student and teacher evaluate the accuracy of the answers. Considerations (Yavaş and İlhan, 1997; Mosston and Ashworth, 2002; Metzler, 2017, Metzler, 1990);

- Develops exploration skills
- The student learns to enter the logical sequence process
- The target topic must be discoverable
- The teacher and the student are responsible for the results of implementation, decisions and evaluation

5.7. Problem Solving Style

In the preparation phase, the teacher is active, in the implementation phase, the student-teacher is active, and in the evaluation phase, the student-teacher is active. There are two types of problem-solving style; (1) the only way of solution and (2) the way of producing different solutions. In one, a single solution to the problem is sought, while in the other possible different solutions are sought. The most important aspect of the style is that it provides the student with cognitive dissonance (while trying out solutions). The teacher prepares the only question that he will direct the student by making all the decisions in the preparation phase, it is a very difficult and cognitively challenging process for the teacher. In the application phase, the student produces the solution/ways in accordance with the problem posed and tries them on the problem. The student and the teacher evaluate the correctness of the answer and solution path. Considerations (Yavaş and İlhan, 1997; Mosston and Ashworth, 2002; Metzler, 2017, Metzler, 1990);

- Develops problem solving skills
- The student learns to develop procedures involving cognitive processes
- The target topic must be discoverable
- The student is responsible for the application, the teacher and the student are responsible for the results of the evaluation

5.8. Personal Program-Students' Design Style

In the preparation phase, the teacher is active, in the implementation phase, the student-teacher is active, and in the evaluation phase, the student-teacher is active. The teacher identifies only a general subject during the preparation phase. In the application phase, the student creates a special focus within the framework of the general subject, discovers the problems and solutions about them. Decides which sub-topics the special focus will consist of. The teacher, on the other

hand, answers questions about the application of the style and examines how the students are progressing. Considerations (Yavaş and İlhan, 1997; Mosston and Ashworth, 2002; Metzler, 2017, Metzler, 1990);

- Develops analysis, synthesis and problem solving skills
- The student learns to develop procedures involving cognitive processes
- The target topic must be discoverable
- The student is responsible for the application, the criteria and the results of the evaluation.

5.9. Student Start-Up Style

Student-teacher is active in the preparation phase, student-teacher is active in the implementation phase, and student-teacher is active in the evaluation phase. The student makes all the decisions in the preparation phase, and for the first time in the spectrum, the student has been active in the preparation phase. In the implementation phase, the student puts the lesson plan planned in the preparation phase into practice. Usually this style is based on the participation of a single student. In the evaluation, the student evaluates the application within the framework of the criteria he has created. The teacher guides the student through all stages. Considerations (Mosston and Ashworth, 2002);

- Requires high education level
- The student should have sufficient knowledge of course design
- The teacher should provide the student with the opportunity for this design
- The student is responsible for the decisions and the criteria and results of the evaluation.

5.10. Self-Learning Style

The student is active in the preparation phase, the student is active in the application phase, and the student is active in the evaluation phase. This style does not occur in the classroom setting. Its defining feature is individual effort and willingness to learn. The individual participates in both student and teacher roles. Considerations (Mosston & Ashworth, 2002; Metzler, 2017);

- Requires high education level
- It is used when the individual is busy with self-teaching
- The teacher has no influence
- The student is responsible for all factors.

6. Teaching Models in Physical Education and Sports

Teaching models in physical education consist of eight topics developed by Metzler. Model use is important for teaching. A model meets certain types of learning needs, but does not include all learning needs (Metzler, 2017, Metzler, 1990).

The benefits of using models in teaching can be listed as follows (Metzler, 1990);

- Provides a consistent approach to teaching,

- Clarifies priorities,
- Offers theme,
- Provides an understanding of current and future learning events,
- presents a unified theoretical framework,
- Supports technical language,
- Provides confirmation of the relationship between learning and teaching,
- Provides a valid assessment,
- Helps in decision making,
- Supports learning outcomes.

Before deciding on a model, it is important to know the strategy areas related to physical education and sports lesson and to plan a model accordingly. Strategy areas related to physical education and sports lessons; (Metzler, 2017, Metzler, 1990).

- Managerial strategies: preventive, interactive, grouping
- Instructional strategies: task presentation, task structure, task engagement level, learning activities, task functioning, student safety, closure
- Knowledge domains for teaching: learning contexts, learners, learning theories, developmental relevance, goals, content, assessment, social-emotional climate, equity, curriculum.

6.1. Direct Education Model

The teacher is the source of all decisions about content, management and participation in this model. It is mostly used for teaching movement patterns and concepts. In the model, psychomotor learning, cognitive learning, and finally affective learning come first, respectively. It offers very few choices to the student. Its assumptions and responsibilities are as follows (Metzler, 2017, Metzler, 1990);

Teaching assumptions;

- The teacher is the main source of content and decisions.
- The teacher should determine the content and create learning tasks in the content.
- The teacher is the most important source of knowledge.
- The teacher is the person who uses the environment, time and resources in the best way.

Learning assumptions;

- Learning takes place as students progress through tasks created by the teacher.
- Students clearly understand the tasks and criteria beforehand.
- Learning is the result of immediate repetitive behavior.
- Students must have a high level of participation in the application.

- High participation rate should be combined with feedback.

Responsibilities

- Starting the lesson: The teacher invites all students to the designated area.
- Bringing-taking the materials: All the materials that will be needed are determined by the teacher. The knowledge of how to use the materials is explained to the students by the teacher and the materials are transported with the help of the students.
- Attendance: The teacher takes attendance and uses time effectively.
- Task presentation: The tasks determined by the teacher are transferred to the students by the teacher.
- Task structure: Planned by the teacher.
- Evaluation: The criteria for the tasks are determined by the teacher.
- Content progression: The teacher decides when the learning task ends and the next one begins.

6.2. Individual Teaching Model

It is a model that allows each student to progress at their own pace with predetermined learning tasks. Each student progresses individually in learning tasks. While the teacher is the source of decisions about content in this model, management and participation decisions will vary from student to student. It is more suitable for students with prerequisite skills. Not suitable for preschool or primary school. Its assumptions and responsibilities are as follows (Metzler, 2017, Metzler, 1990);

Teaching assumptions;

- Teaching tasks can be provided with written or visual resources; the teacher is not the only resource.
- The main task of the teacher is to provide motivation to the students in the application phase after preparing the content.
- The student who remains independent from the teacher learns more effectively.
- The teacher takes the planning decisions according to the speed of the student in the learning process.

Learning assumptions;

- Learning takes place with little dependence on the teacher.
- Students learn content at different rates.
- Students have different capacities for learning.
- Most students achieve their goals if given enough time.
- Students take responsibility for independent learning.

Responsibilities

- Starting the lesson: Each student determines their own start.
- Bringing and taking the materials: The teacher brings the materials that will be needed to the class and the materials are carried by the students after the students use them.
- Attendance: The teacher checks on the students as the students continue their learning tasks.
- Task presentation: Students read or view the task presentation at the beginning of the task.
- Task structure: Students arrange each new task according to written instruction.
- Evaluation: Students self-evaluate some tasks, some are evaluated by their peers, and some are evaluated by the teacher.
- Content progression: The student decides when the learning task ends and the next one begins.

6.3. Collaborative Learning Model

It is a model in which students are grouped into learning teams with the expectation that they will contribute to the learning process and results. Students progress with their teams on learning tasks. While the teacher is the source of the decisions about the content in this model, after the learning teams are formed, the management and participation decisions are in the learning teams. Their assumptions and responsibilities are as follows (Metzler, 2017, Metzler, 1990; Rosenshine, 1983; Slavin, 1980; Slavin, 1983);

Teaching assumptions;

- The main role of the teacher is to facilitate the learning of the students.
- The teacher can act as a facilitator after establishing the structure of group tasks.
- The teacher takes part in monitoring and directing the social learning processes.
- The teacher should strike a balance between social and academic goals.

Learning assumptions;

- Social and academic learning is encouraged.
- Better efficiency is achieved when groups are heterogeneous and the same group works together on several learning tasks and units.
- The performances of all group members should be included in the group score by individual evaluation.
- Roles should be determined in which all group members can contribute.

Responsibilities

- Starting the lesson: The teacher decides what to teach the students and starts the lesson by forming groups.

- Bringing and taking the materials: The teacher brings the materials that will be needed to the class.

- Attendance: The teacher checks the students while the teams are being formed.

- Task presentation: The teacher presents the tasks to the teams.

- Task structure: The teacher decides according to the cooperative learning strategy that each student can participate in. Initially, students manage the tasks, but if they are not successful, the teacher acts as a reflector.

- Evaluation: The teacher presents the evaluation of the students with the rubric. Teams use this table to get the best score.

- Content progression: The teacher decides when the learning task ends and the next one begins, but the speed of reaching the goal can be determined by the team.

6.4. Sports Education Model

All duties and responsibilities that may be in a sports organization are given to students in the form of an organizational chart. The student not only learns to be an athlete, but also learns duties such as coach, manager, referee, participant, spectator, statistician, field officer. A semester or at least 20 weeks are planned as a SEASON, and the course order proceeds in this way. Its assumptions and responsibilities are as follows (Metzler, 2017; Siedentop, 1994; Siedentop, 1998). Plans to be used in a season;

1. Season: It is a planning of at least 20 classrooms that includes periods such as preparation period, competition period, transition period.

2. Team membership: students attend the lesson as a member of the same team throughout the semester. Affective and social characteristics develop.

3. Official competition: students draw up the rules of the game and the rules of the competition. They can prepare the competition calendar.

4. Concluding activity: a concluding activity that can take place at the end of the season in a festive atmosphere is carried out with the planning of the students in the lesson.

5. Statistics: Students record the characteristics of their own teams and rival teams, and in this way their analysis skills improve.

6. Festival: The necessary preparations are planned by the students to maintain the sports competitions in a festive atmosphere.

Its assumptions and responsibilities are as follows (Metzler, 2017, Metzler, 1990);

Teaching assumptions;

- The teacher can use other teaching models to teach different roles.

- The teacher does not control every learning task, but acts as the main resource.

- The teacher guides students for behaviors in sports activities and facilitates learning opportunities.

Learning assumptions;

- With appropriate guidance and facilitation, students can take on many responsibilities at the end of the season.
- Students work collaboratively to achieve group goals.
- Under the guidance of the teacher, students can determine the sports branch that suits them.
- Offers real authentic sports experience.

Responsibilities

- Deciding on the branch and organization of the season: The teacher decides or selects students from the list prepared by the teacher. In the organization of the season, the teacher determines the basic structure, and special procedures are set by the students. A sports committee, usually made up of students, is formed and captains are determined. The teacher guides the assigned students about their duties.
- Determining the rules: While the teacher determines the basic rules, the students determine the game rules through the sports board.
- Execution-preparation-management of the teams: Captain, coach and administrative students are responsible for the teams.
- Bringing and taking the materials: The students are responsible.
- Game organization: Sports committee and referee students are responsible.
- Scoring: Statisticians and referees are responsible for students.
- Evaluation: The captain and coaches evaluate the athletes. In addition, statisticians evaluate the performance of athletes. The sports board evaluates all officials.

6.5. Peer Teaching Model

It is based on students teaching other students, but is not used in the same sense as peer learning or cooperative learning. In these two models, the student is not given full responsibility, and in cooperative learning, the students in the team continue the learning activity at the same time. In peer teaching, the student is given full responsibility. The teacher takes all the decisions regarding content, management, assignment and instruction, but the responsibility for the instructional interactions part rests with the peer tutor to observe and analyze implementation efforts. In fact, it is close to the direct learning model. Its assumptions and responsibilities are as follows (Metzler, 2017, Metzler, 1990; Siedentop, 1998);

Teaching assumptions;

- The teacher retains control of the content, management, task presentation and progression.
- The teacher can train peer tutor students.

Learning assumptions;

- Psychomotor learning is facilitated by feedback from peer tutors.

- Cognitive learning is facilitated by the analysis and instruction of peer tutors.
- Affective learning is facilitated as students take on different roles.
- Develops problem solving skills.

Responsibilities

- Starting the lesson: The teacher starts it.
- Bringing and taking the materials: The teacher brings the materials that will be needed to the class.
- Attendance: The teacher takes attendance.
- Task presentation: The teacher presents the task and the peer tutors show it to the learners.
- Mission structure: Same as mission presentation.
- Evaluation: The teacher determines how the evaluation will be. Peer tutors evaluate learners with checklists.
- Content progression: The teacher decides when the learning task ends and the next one begins.

6.6. Inquiry Teaching Model

This model gives priority to the cognitive domain. Its assumptions are as follows (Metzler, 2017);

Teaching assumptions;

- The teacher encourages the student to think and question.
- The teacher prepares multi-faceted, research-promoting questions.

Learning assumptions;

- The learning content should be meaningful to the student.
- Cognitive learning precedes psychomotor learning.
- The student tries to solve the problem with his previous learning.
- Develops problem solving skills.

6.7. Tactical Game Model

It is the basis of conceptualizing game teaching. It aims to teach the basic principles of sportive games and to comprehend the game structure and tactics. It is a model in which students produce solutions to problems by acting according to the changing conditions in the game. The functioning of the model is as follows (Metzler, 20197; Siedentop, 1998);

- The game is introduced,
- Interest is drawn by mentioning the history of the game,
- Tactical problem presented,

- The importance of tactics and how it is used are shown with game-like learning,
- Tactical knowledge is combined with skill in the game,
- The actual form of the game is played.

- During the real form of the game, the teacher can enter the game as a player, or pause the game momentarily and ask strategic questions. The assumptions and responsibilities of the model are as follows (Metzler, 2017, Metzler, 1990);

Teaching assumptions;

- The teacher identifies the tactical problem.
- The teacher organizes different forms of sportive play to support tactical and skill development.
- The teacher is the main resource, providing students with learning opportunities.

Learning assumptions;

- Participating in the game is interesting from skill exercises for the student.
- The student must develop both performance knowledge and tactical knowledge in order to perform well.
- The level of learning increases with the constructivist approach.

Responsibilities

- Starting the lesson: The teacher starts it.
- Bringing and taking the materials: The teacher brings the materials that will be needed to the class.
- Task presentation: The teacher presents the task, expresses the tactical problem, while the students begin to think about the solution of the tactical problem.
- Task structure: Students organize each task as directed by the teacher.
- Evaluation: The teacher should design an evaluation technique for each task.
- Content progression: The teacher decides when the learning task ends and the next one begins.

6.8. Individual and Social Responsibility Teaching Model

It aims to reintegrate young people at risk into society. The main idea is that the content in physical education programs provides students with opportunities to practice and learn how to take responsibility for themselves and others. This model works in accordance with the standard content of physical education programs. The model has five levels and learning areas (Metzler, 1990; 2017);

Level 1.	Respect for the rights of others
Level 2.	Collaboration, participation and effort

Level 3.	Self-management-self-direction
Level 4.	Helping and leading others
Level 5.	Non-physical education-transfer to life

The assumptions and responsibilities of the model are as follows (Metzler, 2017, Metzler, 1990);

Teaching assumptions;

- Responsibility can be taught at a high level in good faith.
- In teaching, students are provided to make positive personal and social decisions.

Learning assumptions;

- Learning should be student-centered
- The activity content should be meaningful and positive for students and provide ample opportunities.
- Equal progress should be ensured.

Responsibilities

- Starting the lesson: The teacher starts the lesson from the perspective of the students' level.
- Task presentation: The teacher presents the task separately for each activity.
- Problem identification: The teacher determines the problem area by observing the students.
- Select activity: It is chosen by the teacher. The objectives of the activity are presented to the students. The missing points are discussed.
- Evaluation: The teacher specifies the issues that will cause problems to the students and the parameters they expect for their solution.
- Content progress: It is under the control of the teacher according to the status of the students.

7. Assessment and Evaluation in Physical Education

Measurement in the field of sports should be handled in three stages (Siedentop, 1994; Rosenshine, 1983);

- Recognition: Readiness tests, observation, interview, ability tests are used to determine the beginning levels of students.
- Monitoring-shaping: tools such as monitoring tests, practice activities, structured grid, diagnostic branched tree, word association, self-peer assessment, group assessment, projects, observation forms are used to eliminate learning deficiencies and improve learning.

- Result-product: final exam, practice exam, observation, interview forms, projects are used to determine the level of the student in terms of achievements.

8. Feedback in Physical Education Teaching

Feedback is the information system after the movement about all stages of the movement. It is divided into two as internal and external (Mosston and Ashworth, 2002).

1. Internal feedback is the evaluation of the information received from the sensory receptors of the person performing the movement.

2. External feedback, on the other hand, is when someone other than the person performing the action informs about the result of the action or the performance. As understood from the definition, external feedback is either directed towards the result of the action or is directed towards the stages of performance. External feedback is the term that comes to mind when it comes to “feedback”. Feedback can be given from audio, visual, video recordings and biofeedback (such as health data). It has 4 main effects. These are (Mosston and Ashworth, 2002; Griffin et al., 1997);

- Motivation: Getting information about the individual's performance in the learning of the movement motivates the individual about learning,

- Reinforcement: Particularly positive feedback reinforces the emergence of the desired behavior,

- Providing information: The main task of the feedback,

- Dependency: Too frequent feedback leads to the habit of ignoring internal notifications, damaging the learning of the movement. In other words, as the frequency of feedback increases, regression can be seen in learning.

According to Mosston and Ashworth, the types of feedback are as follows (Mosston and Ashworth, 2002; Griffin et al., 1997);

- Value statements: reflect feelings about performance. It can be positive or negative. It should include judgment. Expressions such as very good, great shot, very bad, successful. It is used to motivate students.

- Corrective statements: statements containing corrections to performance or result. Intensive use can lead to the proliferation of errors. Excessive use may prevent further trials. It is used in two ways; either reveals the error (like you didn't make the right move, it's wrong), or gives information on how to correct the error (like you are holding your racket wrong, you should turn your wrist inward). Statements such as stop, don't, enough are also vague corrective statements.

- Impartial (neutral) statements: It does not contain corrections and judgments, giving information about the performance. Overuse may cause the notification recipient to become alienated from learning the skill. Two of the five shots hit the goal, you ran in 15 seconds, you completed 28 sprints. It has little effect on learning.

- Ambiguous statements: these statements do not provide information about performance, value, explain the error and how to fix it. Overuse will cause misunderstandings

and hinder learning because one will have to guess the meaning of the expression. Repeat, it was interesting, it's not bad, it could be better. It has little effect on learning.

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