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Buildings, Architecture

Textbook for the teaching of architectural culture
at the secondary school level

Theses

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1. Why should architecture be included in public education?

Architecture is the material frame of human life. In addition to providing shelter and protection, architecture takes on the form of human beings' fundamental activities; it expresses certain thoughts and emotions of the inhabitants. Architectural forms, structures and materials not only serve to define, maintain and insulate spaces, but they also have a symbolic meaning. Art history, aesthetics and communication theory study this meaning, which extends to the society and culture of an era.

Architecture promotes the spatial organization of human activities; for example, settlements ensure a suitable place for a group or community to live, with buildings for family life, work, education and leisure activities. Because architecture, from the perspective of maintaining social existence, provides space for fundamentally important human activities, it has special significance in terms of creating the human environment.

Just because a phenomenon has an important role in human life does not mean we should teach it. For example eye contact and maintaining certain distances are important in human relationships, but we do not teach them in schools. We learn how to climb stairs, open doors and find our way on the streets in our private life. But geography, including the characteristics of large regions of the world and the lives of peoples from other lands is taught in schools, just as historical periods are too. These subjects and areas of knowledge examine the vast interconnectedness of human life. They also look at the natural and built environment of societies as well as the events and the various approaches to life throughout time. These subjects already deal quite a bit with architecture, asking how people live, what their settlements are like, and what famous buildings there are. A type of building, such as the ancient Egyptian pyramids or the factories and industrial districts of 20th-century cities, characterize certain regions and periods. Architecture is one of the three major branches of art history alongside painting and sculpture, and deals mostly with those buildings and towns that have achieved such a high level of technical execution that they gain artistic significance, and are thus considered beautiful (*Boas*, 1975). In keeping with the traditional understanding of beauty, we learn more about medieval castles, Renaissance palaces and Baroque churches, and less about 19th-century ironwork bridges and covered-markets or 20th-century housing estates, although the majority of us are most interested in the quality of our present environment.

Architecture appears in school curricula also because it is concrete and expressive, and thus from a pedagogical perspective, valuable. While a concept in physics, such as specific gravity does not itself exist, instead used only to characterize a material, a house can be seen, a door handle grasped. A concrete experience is key in terms of remembering and consequently learning, and we know that it is the basis upon

which concepts are abstracted (*Vigotskij*, 2000). We can now locate in the brain the 'reality centre', that is, the place in the brain which confirms or questions our perceptions. This reality centre makes its judgments based on experience. An architectural example, because it is close to human beings' natural understanding, is easily remembered and can thus be taught quickly and effectively.

In the last thirty or forty years, among scholarly issues, global problems have become a topic of interest and concern for everyone, with green movements becoming a political force to be reckoned with. Local solutions, controllable and reasonable methods, have increased in value in contrast to universal ones. This is reflected in the changes in understanding of history and the spread of a feminist view of the past. The feminist approach is not primarily about a struggle for equality between the sexes, but rather about how everyday events, such as the popularization of refrigerators in households, or the use of radios and tape recorders, which shaped music culture and our attitude toward life, belong as much to our lives and to history as do kings and battles. This means, from an architectural perspective, that in addition to learning about the great masterpieces of universal architectural history, it is important to analyze the microclimate, the environment built by individuals and smaller communities, and to appreciate its values too. Whether we are thinking about a new flat or offering an opinion on a plan proposed by the local government for a new shopping centre, such questions are important: What is my home like? What do I need to feel good in a given built environment? What knowledge do I need to influence the decisions which will shape this environment?

Teaching architecture can therefore contribute to the improvement of a more narrow or more broad human environment, and not merely with regard to the building's form or colour, but also in terms of the distribution of appropriate functions within a settlement, the limiting of unnecessary and harmful activities, the strengthening of neighbourly relations, and the fostering of local patriotism. Moreover, it could lead to a healthy atmosphere for debate and encourage citizens to exercise their rights. In the next part we shall examine whether architectural education of this kind could be widely adapted in Hungary.

2. What are the possibilities for teaching architecture in Hungarian public schools?

The profession of architect is taught at technical universities and colleges. Architectural engineers and tradesmen such as masons, carpenters and tillers are professionally trained. In regular secondary schools and non-specialised technical schools architecture is taught as a cultural phenomenon, integrated into the curriculum subject *Drawing and Visual Culture*. At the lower levels, architecture, as part of the general education in technology and art, is included in the curriculum subjects *Way of Life and Practical Knowledge* and *Drawing and Visual Culture*. The national curriculum (2003) determines in what year and how many hours per week these subjects are taught, but every school or school group is then free to teach everything, including architecture according to their own programme of studies. In addition to those listed above, other subjects, mainly history, geography and literature may also touch on architecture.

3. What are the methods of teaching architecture in Hungarian secondary schools today?

The rest of this study will deal with the opportunities and practices of general secondary schools, technical schools and training colleges. At this level of schooling there is no longer a 'technology' class, and an integrated discussion of architecture is only available in the *Drawing and Visual Culture* class. According to the national curriculum one class in the arts, either singing or drawing (very few schools offer drama), is required in the first two years of secondary school and optional in the third and fourth years. These classes are offered once a week for one hour, thus 36 hours in a year. Half the course could be devoted to creating art and the other half to analysing artworks. But it is also possible to divide the year between the branches of art, with one-half to two-thirds of the time spent on painting and drawing and the rest divided up between sculpture and architecture. This would mean an extremely brief amount of time, only about 4 to 8 hours, for the teaching of architecture.

Schematic calculation of curricular hours:

Year/subject	Painting, Drawing	sculpture	**Architecture**	Total hours per year
9.	24	6	**6**	36
10.	24	6	**6**	36
11–12 drawing or singing	48–24–0	12–6–0	**12–6–0**	72–36–0

The majority of teachers in secondary school were trained as secondary school teachers, and therefore studied at the University of Fine Arts, the University of Art and Design, or perhaps the University of Pécs. Although the public education law (1993) requires university training, in many places, especially in rural areas, this requirement cannot be met, and drawing is taught by graduates of training colleges. The style and approach of the painter characterize the nature of the teaching (Kárpáti, 1994), in other words, artistic self-expression inspired primarily by a natural scene prevails, accompanied by instruction in drawing techniques. During these classes, architectural tasks are also set, for example drafting an imaginary street in perspective or colouring a contour drawing of a furnished interior of a flat according to a given rule (for example, using warm tones). Analysis of art usually consists of an introduction to and analysis of artwork from the major stylistic periods, thus grand art and the past dominate. Twentieth-century works certainly include Le Corbusier's chapel at Ronchamp, Hundertwasser's block of flats in Vienna and Imre Makovecz's church in Paks. Thanks to efforts to modernize, the analysis of the everyday environment, mainly the media is increasingly apparent in education. Contemporary art, however, is scarcely touched on. Designing objects is also included, with students asked to design packaging or a carrier bag with advertisement. A frequent architecture assignment is to design your own house, draw a ground plan and an axonometric projection of its exterior. While it is generally true that teachers are open to up-to-date content and methods, for the time being 'applied art' assignments seem to be foreign to their way of thinking. Moreover, their efforts are not sufficiently supported by adequate teaching materials, textbooks and collections of easily prepared tasks.

Textbooks

The textbooks currently in circulation (unlike in the past when there was only one textbook available, now there is a wider selection) reflect the author's academic background and creative disposition and include task-oriented drawing books or art history books that are introductory and analytic in nature. We shall briefly discuss within the scope of our subject-matter three of the most widely used secondary school textbooks as well as a few interesting, new publications.

Ágnes Pázmány and Éva Permay (1991): Látás és ábrázolás (Seeing and depicting)

A true drawing-art history textbook, this richly illustrated, 136-page textbook acquaints the reader in clear yet technical writing with the process of seeing and thinking. The analytical chapters address questions of space, form, colour, composition and depiction. When discussing space, the authors devote six pages to architectural spaces. Although there is no separate unit on architecture, references to it appear in every chapter. Each chapter includes a list of creative tasks.

László Beke (1985, 1993): Műalkotások elemzése (Analysis of artworks)

There have already been more than a dozen editions and several revisions of this textbook designed for secondary school students, and it still remains popular, despite several competing volumes published in the past decade. Perhaps the reason for its success is its straightforward presentation of the fundamental questions of art and the problems of depiction, decoration and material culture. The book also provides interested and discerning readers with a clear discussion of the major stylistic periods, and, above all, insights into important works of art. Two-thirds of the book consist of reproductions of artworks accompanied by brief, but apt analyses. The subject of architecture and its quintessential works is addressed within the section on stylistic periods. At the end of each unit are about five or six questions encouraging comparison and analysis.

Attila Szabó (1998, 2003): Művészettörténet vázlatokban (Brief discussions in art history)
Attila Szabó (1998, 2003): Művészettörténet képeken (Art history in pictures)

These two works are companion volumes, one containing the text and the other the pictures (228 p. 1036 ills.). The focus of this art history book is the fine arts, although sections on history, religion and philosophy begin each chapter, and literature, music and dance are also surveyed. This uniformly edited, well organised book is an ideal teaching tool, with the typography highlighting the keywords for students. The brief discussions, summaries and lists themselves provide an overview of art history, but are best used in sorting out, storing and retrieving information learned during class. For each art historical period, there is a separate sub-chapter devoted to architecture; thus important buildings, architects, structures, techniques and terminology can be learnt. The book does not contain any question or tasks.

Erzsébet Tatai (2002): Művészettörténeti ismeretek (A concise history of art)

In keeping with the guideline of the national curriculum (1995) this meticulously edited book is organised by genre rather than historical periods; thus architecture is addressed in a separate chapter, taking up 35 of the volume's 300 pages. The chapters, consisting of explanatory text and illustrations with captions, are suitable for independent study and for recalling material learned in class. The subheadings themselves already reveal the book's modern approach and complex way of looking at things. The second sub-section of the chapter on architecture examines the connection between architecture and the natural environment, using the examples of residential buildings, shrines and public buildings to discuss the functions of buildings. The third sub-section deals with settlements, while the fourth looks at architectural tools of expression and includes a discussion of the main types of structural frameworks. The book does not contain any tasks.

György Merényi (1998): Tárgykultúra, környezetkultúra (Material culture, environmental culture)

Closing a gap in its own genre, this approximately 200-page, illustrated book attempts to find the unity of the given period, the buildings and the material world. Each stylistic period is introduced almost as a case study with the use of a well-chosen example. ('A Block of flats on Andrássy út: The Saxlehner House' is used to illustrate 19th-century Romanticism.) At the end of the book there is a separate small chapter on material culture, environmental culture and design. Comprehension questions accompany each chapter.

Mária Tatai (2003): Az épített környezet [The built environment].

Although designed for non-architects in institutes of higher education, this book proves a useful text for secondary school students as well because of its straightforward, enjoyable style and illustrated case studies, and is thus included in our present survey of textbooks. The book examines architecture not only from the perspective of the builder but from the user's point of view as well, addressing both function and aesthetics. The second part, a separate section, deals with the definition of architectural space and the fundamental aspects of spatial analysis.

Analysis of the textbooks and teaching tools available in Hungary reveals an adequate amount of high-quality teaching material in art history and art analysis that deals with architecture. Understandably, the examples include only outstanding works of art. Also, the material offers no real assistance in interpreting our everyday architectural environment or addressing this topic in the classroom**.** While the textbooks contain questions and thought-provoking tasks in addition to the texts, these are only art historical in nature, none requiring creative, hands-on activities. Consequently, creative work offering its own experience and thus making the subject-matter more memorable is severely lacking.

The subject of architecture is excellent from a pedagogical point of view. Concrete buildings materialize, and thus require no separate explanation; natural perception

is sufficient for recognition and elementary interpretation. Spaces are intertwined with human activity, and can be expressed in movements and gestures, such as a gate flying open or a tower breaking through the sky. We identify with spaces and houses (just think of our home), and therefore they play a large role in the forging of identity. Well chosen school tasks in architecture can stir an entire personality; they can formulate concepts, ideas and notions, uncover connections, develop creativity, allow room for making associations; in other words they can give rise to creative thought and activity. Building, installing, and modelling are crucial in developing an understanding of how things work. Teenagers' skills in construction and space perception can only be further developed with appropriate tasks, and architecture is ideal for this. Architecture, given the nature of the discipline, demands group work, which encourages the practice of social skills.

4. Theses

1. The analytical aspects of the architectural environment can effectively be mastered through analysis of the everyday architectural environment.

2. Experiential, hands-on creative tasks play a crucial role in developing the skills (space perception, constructive and analytical skills, good judgment, and communication in various forms, especially drawing and interpreting pictures) that determine the architectural environment.

3. Architectural education naturally includes methods of group problem solving which develop students' social skills.

5. The theoretical background of these theses

1. The analytical aspects of the architectural environment can effectively be mastered through analysis of the everyday architectural environment.

From the beginnings pedagogy has extended knowledge to students. While in the Middle Ages only a select few had the opportunity to acquire knowledge derived from God, and learn about the divine order, cosmic connections and classical teachings, in the 19th century the goal was to master human science and the outstanding achievements of art. Today the mass of students, essentially all young people, are inspired to learn the skills necessary for everyday happiness. The common cultural foundation of specialised knowledge can be acquired by students in their twelve years of general education. Our subject, the history of architectural education, also extends back to ancient times, but here we shall only mention the most important phases from the past fifty years.

The leading example is craft education in Great Britain, where in the mid-20th century the copying of sample works began to be replaced by original creations based

on actual design work. The change in direction is reflected in the change in the subject name: *Craft*, then *Craft and Design* and most recently *Design and Technology*. Changes have taken place in theoretical education too. In addition to classical art history, courses are being taught in the early forms of consumer education and the features of major product types. Even in the receptive climate of England, the practical change in direction was difficult to advance, since general education was at that time largely decentralised. Schools were controlled by local authorities. Professional organisations recognised, however, the importance of development, and under the leadership of the Design Council, created the Schools Council Design and Craft Education Project, which published a good series of books introducing various exercises in the 1970s. Meanwhile the Design Research Unit was formed within the Royal College of Art, headed by Bruce Archer, a famed architectural theoretician, and a great deal of theoretical research was carried out to support the practical work (*Eggleston*, 1976).

The change in approach to the teaching of architecture also fit within this framework. Teachers were greatly aided in understanding and employing the new approach by the journal *Bulletin of Environmental Education*, which contained tasks and solutions and was written for teachers and edited with their assistance. In its heyday the journal was in active contact with 2000 schools and teachers. The insights gained by the editors were shared in the publication *Art and the Built Environment* (*Adams*, 1982).

We have followed the events in Hungary since 1980, since the competition *Építészek a technikai nevelésért (Architects for technological education)*, in which several architects striving for reform, took part. Among them was Mária Tatai, an architectural engineer, and Erzsébet Tatai, a drawing teacher, under whose leadership and educational experiment, *Környezetkultúra* (Environmental culture), designed to cover the eight years of elementary school, was carried out in Budapest and Kerekegyháza between 1986 and 1995 (Tatai, 1993). A knowledge of the child's mind stood at the heart of this teaching material, which unlocked the entirety of the natural and built human environment. The authors proved that in the areas of building as a process, and creating and analyzing space great achievements can be made with students even under the circumstances found in Hungary, if one has the aid of well-edited teaching material.

In England and France, as part of the programs *Heritage Classes* and *Les Classes Patrimoines* superb methods were devised for teaching the appreciation of important national monuments. In Hungary only the movement *Tájak, korok, múzeumok* (Regions, periods, museums) is comparable. In these centres, under the direction of museum educators, students learnt about the given building and the way of life and the mentality of that period through modelling, building and drama exercises which bring the period to life. A summer architecture camp in Ócsa was held in connection to the competition for young people, *Tervezzünk tárgyakat!* (Let's design objects!) organised annually between 1986 and 1994. Here secondary school students, under the direction of Katalin Bodor, drew and photographed selected houses within the village. Students also gained an appreciation of the buildings and the lives lived within through conversations with the inhabitants (Bodor, 1998). The camp became an example for other school initiatives in uncovering the treasures of their own local environment.

In summary, good international literature and the lessons of several Hungarian experiments are available today to help us effectively teach students about universal, national and local architectural monuments of value.

2. Experiential, hands-on creative tasks play a crucial role in developing the skills (space perception, constructive and analytical skills, good judgment, and communication in various forms, especially drawing and interpreting pictures) that determine the architectural environment.

It is an old truth that we better remember those things to which some experience is attached. This is why they used to beat boys who made the ritual crossing of the village border on Saint George's Day, so they would always remember the size of the territory they were responsible for. The schoolmaster would pull students' ears to stimulate brain circulation. Fortunately today, most agree that people try to cast aside bad experiences, thus beatings or humiliation will not lead to better learning, and should not be linked to it. Stirring up good memories, on the other hand, remains a teaching tool. It is best if we can build on children's natural curiosity, although we know it is impossible to harmonize the diverse interests of thirty students every day for hours at a time. For students and teachers anything that makes the twelve years spent together easier is a welcome relief. What we see as the huge and wonderful human culture, students often view as an unfamiliar, gargantuan mound of mush, an abstract mass that towers threateningly over them. Students may wonder, 'How can I learn what brilliant minds have drafted over the centuries?' Not only does children's knowledge grow but they regain their self-confidence when they discover something, such as the characteristics of their own built environment, through their own experience, at their own tempo and in their own language. The other option is gaining operational knowledge, such as mastering the techniques of bike riding, music or arts and crafts (Németh, 1989). An advantage of experiential activities, which can be carried out in groups, is that people often fall into a meditative state, and at such times even the spoken word is more easily remembered. Beyond the fundamental truth stated at the beginning of the paragraph, we shall now look at the more concrete results of research that has demonstrated the advantages of architectural education.

In an extreme case, a Hungarian group used art projects to develop the skills of disadvantaged Roma students (*Deszpot*, 2005). Their hypothesis was that only a meaningful experience, such as an interesting art project, could shake students from their state of lethargy. They even prepared the students' teachers by having them carry out an art project, rather than explain to them the advantages of the project; thus the teachers too experienced directly the powerful impact of experiential learning. The student's self-image and self-esteem, the most important of all the factors, were examined before and after the project and a strong tendency toward improvement was observed.

Between 1989–1993, the *Leonardo program* examined the suitability of new teaching materials in five areas of the visual arts (Kárpáti, 1996). Researchers examined the teaching of environmental culture, colour theory, art analysis, photography and film and the integrative approach to aesthetics in order to better understand the system of impact on students; consequently results were measured using tests in art analysis, depiction, psychology and pedagogy. Researchers determined that, among others, students' space perception developed more quickly than normal among those who were required to build models during the course of the experiment. In other words, students in the group studying environmental culture experienced improvements in

their ability to view space, while those in other groups showed no significant gains. In contrast to popular belief, development depended not on a good teacher, but on suitable methods!

Those students who already have an inner picture of the process can carry out a construction project more quickly, more accurately, and with fewer trials. This was the lesson of a series of experiments carried out by Hungarian psychologists in the 1970s (*Porkolábné*, 1979). An inner picture of the process takes shape if the person actually carries it out, if he or she plays, builds and installs. We also know more about the structure of this inner picture. It incorporates an algorithmic process in time, a spatial envisioning of the object and its geometric dimensions, a familiarity with both material and structure, and an ability to make a decision. Work with concrete objects, materials and structures, and the experience thereby acquired play a great role in the sharpening of this inner picture. (*Gaul*, 2001).

As for the development of communication skills relevant to this section, it is enough to say that, for example, experience of the actual space plays a crucial role in the depiction of the space (whether it is a drawing of a view, an axonometric projection or a perspective drawing). In other words the process of construction can be taught – the lines meet at one point – but a child will only understand that a given line corresponds to a part of the space if he or she has seen it, gone over to it and felt it. Therefore we need to walk around the room, or climb the hill in order for our concept of space to develop so that we can draw it.

3. Architectural education naturally includes methods of group problem solving which develop students' social skills.

Aronson's book *The Social Animal*, one of the fundamental works in social psychology, contains an anecdote about how Aronson, as the father of a small child, is astonished at a contemporary school practice. The teacher asks a question, twenty volunteer, one is called on, the others are disappointed and after several months only the small group of frequently called-on children are interested in the school, the rest have turned away. Aronson suggests they do group work, in which every child at the same time can be active, participate, feel important, learn and enjoy going to school. At the same time, if the make-up of the group is good, then social bonds also strengthen. In the three decades that have passed since this improvised programme, numerous methods have been developed to make more effective use of class time and to improve social perceptions. One successful method is associated with the American teacher Spencer Kagan. (In Hungary, Kálmán Benda carried out groundbreaking experiments).

In his book *Cooperative Learning*, Kagan introduces a large number of tried and tested methods. These methods are brilliant because they work with many different kinds of material. Kagan himself does not claim that his method is always the best, in fact he cites an example in which group work can not produce the same effect as reading aloud to the class a moving literary passage. (As we have learned, individual reflection can be an extraordinary experience, and this too can be used in teaching.) But we can be certain that group work is generally more effective and social skills, emotional intelligence and empathy develop better within a group. Group work is

also indispensable because in cooperating with others, students learn techniques of being assertive and resolving conflicts. Interpersonal relationships also play a large role in the development of a positive self-image. Considering that architecture is a collective discipline, its only natural to use group work in addressing architectural questions. After all, the constructors and users of buildings are both human groups, and the relationships and conflicts between them can be modelled in the classroom.

6. Examples from the material designed for the practical realization of the theses. From the chapter 'The residential building and the flat'

1. The analytical aspects of the architectural environment can be effectively mastered through an analysis of the everyday architectural environment

In the task 'matching house and fence' photographs of contemporary houses and fences in Szentendre can be seen (p. 25-26). There are six houses and twelve fences, and students must rely on their instincts and taste to choose which fence they feel best matches with which house. Students do not all make the same pairs, which is not a problem; in fact it is good for students to see that a problem can have more than one solution. The goal of the task is for students to bring their own sense of good taste, and then think about all that goes into making a decision. The task also has analytical aspects (security, aesthetic and sociological functions), which can be included in the discussion of the various pairings. The students also connect people to the kinds of houses and fences; they can easily imagine the lifestyles associated with each set of house and fence. Thus students can use examples from their everyday environment to address a real-life situation, in a playful way.

2. Experiential, hands-on creative tasks play a crucial role in developing the skills (space perception, constructive and analytical skills, good judgment, and communication in various forms, especially drawing and interpreting pictures) that determine the architectural environment.

In the task the 'teacher's house' a ground plan by Lajos Kozma has to be transformed using a given set of conditions (p. 23). This is essentially a task in functional design. 'I'll put my grandmother in this room', says the student trying to place the changing family members.
In designing the 'the house of the imaginary hero, Harry Potter' the task is primarily to imagine the style of the person and represent this. (p. 24). By representation, we of course mean the building designed should embody the appropriate character. (Technical and economic problems at this level are a waste of time, turning creative play into a specialized task.)

3. Architectural education naturally includes methods of group problem solving which develop students' social skills.

In the task 'Our house' the class breaks up into groups, and the groups create a family, with a mother, father, and children and together they have to agree on where and in what kind of house they want to live (p. 23). Then together they design the house or flat and furnish it, naturally just on the ground plan. Finally the drawings are put up on the walls of the classroom and the groups evaluate each other's work. The participants (the 'family members') can argue their point of view for awhile, but the house will belong to all of them, so in the end they will have to join forces. In this activity cooperation, which is just as much a human quality as competitiveness, is strongly emphasized in addition to competition (*Csányi*, 1994).

7. Summary

Based on the research work discussed in the first paragraphs, we can state that the teaching of architectural environmental culture in public schools is useful and important. An analysis of textbooks in Hungary show that while there is plenty for teaching art history and analyzing art, there are no teaching materials, and especially no workbooks, to help students become familiar with and analyze their contemporary everyday environment. At the same we have a suitable set of resources to aid us in creating a textbook for teaching architectural culture at the secondary school level:

i. The quantity and quality of Hungarian-language literature in architectural theory provides a sufficient base.
ii. There is also sufficient Hungarian-language pedagogical literature.
iii. In addition to several international sources on architectural education, there has been some groundbreaking material published by Hungarian authors too.

Based on international professional literature, Hungarian groundbreaking experiments and up-to-date pedagogical principles, we can establish the requirements for a future textbook:

i. It should include outstanding architectural examples and methods for analyzing the everyday architectural environment.
ii. Not only should there be an abundance of examples, but there should be as many Hungarian ones as possible.
iii. The focus should be on the present.
iv. The approach should be as practical as possible.
v. The information section should contain as many case studies as possible.
vi. The text should be accompanied by illustrations, mainly photos.
vii. Problem solving should play a large role in the students' mastering of the material.

viii. The students' tasks should include many practical activities.

xi. Group work should play a prominent role, but not to the exclusion of individual and pair work or direct tasks when these methods would be better.

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