



Research Article

**COMMERCIALS AS PART OF DAILY LIFE SITUATIONS -
IMPULSES FOR CHEMISTRY TEACHING AND FOR
METHODICAL REFLECTIONS OF MS-COURSE STUDENTS
OF THE HO CHI MINH CITY UNIVERSITY
OF EDUCATION/DEPARTMENT CHEMISTRY IN NOV./DEC.2018
(PART 2)**

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ABSTRACT

*This article describes possibilities of higher education didactic to qualify the students' professional knowledge about pupil behaviour in the frame of the teacher training. The article is a plea to teach Chemistry more pupil-orientated than presently. The conception "pupil orientation" is considered in actual education policy-initiated efforts in Vietnam. The author concretizes his previous explanations in the "Journal of Science (HCMCUE)" about "pupil-orientation" relating to own experiences of a methodological seminar for master students. At the same time, a Didactic of the Didactic of Chemistry is emphasized. **Part 2** analyses and interprets the students' achievements on the background of the seminar concept. Consequences for the teacher training in Methodology are discussed, possible changes are justified.*

Keywords: Didactics in Higher Education; the conception of pupil-orientation; learning processes of master students; teacher training in Chemistry Education; advertisement

Personal Foreword

The article is dedicated the Dean of the Department of Chemistry of the Ho Chi Minh City University and two colleagues of the Division Chemistry Methodology. Associated Prof. Dr. Vu has supported explicitly my research – and teaching activities in the time from 2013 until 2019. Time and again he has encouraged me to teach the students the topic pupil-orientation – in all facets. My colleagues, the Methodologists Ms. Dr. Minh and Ms. Hoa, M.Ed., have assumed a lot of diverse translating activities over time. Common discussions about intercultural perspectives of Methodology or Chemistry Didactic have enriched my seminars on the HCMCUE. Intensively I have debated with Ms. Hoa the importance of a popular Chemistry teaching in Vietnam based on her differentiated research results.

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1. Evaluation – Students’ Orientations and didactical perspectives

1.1 General remarks

I will interpret all the documents from the master students in a quality sight. The interpretation considers my personal impressions of the seminar work. My impressions and findings have been concentrated as perspectives or hypothesis about the knowledge and awareness of the students. I specify which students are arguing accordingly. E.g. *St 1* means Student 1.

1.2. Perspective – Students’ Reception of the assignment

All reports documenting the serious and independent employment with the task. The commercials are described making sure by themselves (*St.2, 7, 8*). Thus, the student reception is easy to follow and to understand. In total the commercials are analysed or interpreted in a methodological sense, often enriched with secondary literature references (*St. 1, 7, 8*). All home works report suggestions to insert commercials into chemistry teaching. Only one home work does not reflect the methodological task (*St. 11*). It is a chemical cause analysis on the subject of cleaning and detergents. Another report focuses on the reception of commercials in a family environment (*St. 2*).

The home works written in English are transparent, understandable, and carefully crafted – partly with color illustrations from the commercials (*St. 3, 4, 5, 6*). They often conclude with a personal point of view (*St. 2, 7, 8*). Reviews are part in my seminar’s didactic. On the one hand, the descriptions are mostly unstructured. Section headers are missing (exception *St. 3, 7*), also if mental connections obviously change. On the other hand, in the heuristic approach of students, a mental structure is created only in the course of describing or the act of knowledge acquisition. In this respect, I think this representation is adequate and reasonable.

The search for the correct use of the English language in terms of expression, grammar, syntax, and appropriate wording was pronounced in all texts. The bilingual entitlement was taken seriously, arranged, and differentiated according to individual options. It was consistently implemented. Switching between English and Vietnamese was commonly rare (*St. 4, 11*).

1.3. Perspective – pupil orientation as a methodological conception

- **In General**

The commercials are interpreted as media concerning a pupil oriented approach. Methodological possibilities are trenchantly created (*St.2, 6, 7, 8, 9*). The students take into account the seminar contents and literature offered as copies in the seminar reader (*St.1, 6, 7, 11*). Pupil orientation is assumed as necessary for pupils’ mental development, even though the cognitive interpretations of the students are varying (*St.3, 6, 7*). Therefore, master students intend to use commercials and product information for everyday chemistry teaching (*St. 1, 2, 6*).

Commercials should motivate the pupils to learn chemistry, so the meaning of all students. Their applications are methodological concretised (*St.3, 6*). Possibilities refer to methodological scaffolding for a pupil oriented context (Becker, 2018). The learners should have the chance to interpret commercials in a chemical sight (*St. 9*).

Direct references to people's everyday lives are exposed in almost all reports, methodologically significantly regarding environment, health, hygiene, and economics (*St. 2, 5, 6, 7, 10*) and demonstrating the importance of chemistry for life as a goal of chemistry teaching (*St. 2, 5, 6, 10*). Occasionally, it is noted that commercials in the classroom initiate communication skills. Learners have to evaluate everyday situations or phenomena critically (*St. 5, 6, 9, 10*). This critical perspective is emancipatory (*St. 9*). Critical thinking is supported if learners at the same time have a chance to interpret professionally products advertising on the background of the learned knowledge (*St. 9*).

- **Daily-life perspective**

Environmental orientation is an important part of the chemical education (Becker, & Nguyen, 2013b). Commercials strengthen and emphasize this function of chemical education. They are a moment in the everyday life of the consumer (*St. 1, 2, 5, 6, 8, 10*). As a teaching object or as medium, they help students as future consumers to orientate in the field of cleaning agents. Environmental orientations are to anchor in classroom teaching and/or curricula, so the opinion of almost all students.

The so-called product perspective is associated as a moment of daily live orientations (*St. 1, 6, 8*). Commercials and everyday cleaning products will be seen as a suggestion:

- to compare experimentally washing power and composition of everyday detergents in teaching (*St. 9*) or
- to analyze their composition (*St 11*).

Product orientation gives an analytical perspective of chemistry (*St. 1*), also through sensory experiences (Minh et al, 2017 and 2018).

- **Pupil's conceptions or imaginations**

A pupil oriented chemistry teaching must keep or base everyday conceptions of chemistry or conceptions respectively imaginations of people about chemistry (*St. 3, 5, 6*). Incorrect chemical conceptions in the commercials are mighty influent (*St. 4, 5*). Usually, the functions of cleaning and detergents are memorable explained in the commercials by analogies often suggested physical or humanized: Chemistry is mentally represented by these ideas. Sure, students draw attention (*St.4, 5*). Actually, substances and functions in everyday life are determined rather by everyday thinking and ideas than by objective chemical perspectives (Becker, 1993). The danger is seen that non-objective, but already potentially effective explanations are adopted by permanent reception of advertisement (*St. 4, 5*). Students stress from methodological point of view to illustrate chemical structure and function of detergents by using formulas and structures, thus to model as chemical

corpuscle or particle (*St. 4, 5*). The commercials are mentally qualified off-mediated performances and are considered in the elaborations often humorously (*St. 4*). Learning and understanding of chemical conceptions is a large learning problem for the pupils as in the last 30 years became acquainted through international researches.

- ***Teacher's behaviour***

Pupil orientation is as an approach to realize by an open, situational teacher behavior (Becker, 2018). This aspect is mentioned often in the elaborations, sometimes between the lines (*St. 1, 5, 6, 7, 8, 9, 10*). At the same time, Chemistry teachers must "deconstruct" previous cognitions of learners and help learners to "construct" (new) chemical cognitions (*St. 6, 8, 9*). Appropriate methodological structures and processes are to develop or to performance by teaching. The teacher empathy is associated as a major condition (*St. 6, 8, 10*).

1.4. Perspective – Methods

All papers are documenting more or less methods-orientation as basic for teaching processes. On the background of teacher training and practical teaching experience, this was to be expected (*St. 3, 6, 7, 9*). It is methodologically discussed to insert commercials as subjects (*St. 3, 7, 9*). The most students prefer to start the teaching lessons with the commercials (motivating function) or to finish the teaching lesson with commercials (controlling and repeating functions). Occasionally, it is suggested that learners compare substantial explanations of the commercials with textbooks' content (*St. 6, 7, 10*), applying chemical knowledge (*St. 8, 9*): Individual knowledge structures are consolidated or designed (*St. 6, 8, 9*). Sometimes it is concretized how learners evaluate commercials with their acquired chemical knowledge (*St. 6, 9*). In this respect, commercials are a communicative impulse to use technical terms and/or to implement wash phenomena experimentally (*St. 11*).

Commercials are methodological preferred to generate chemical structures of the washing process (*St. 3, 8*). In this respect they are interpreted as behaviorist starting point to present objective chemical knowledge and also to illustrate appropriate experiments (*St. 6, 7, 9, 11*). All home works note this methodological perspective (*St. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10*). Details of the commercials about chemical composition and chemical effects of the substances are problematized (*St. 3, 4, 7*). The technical scaffold is pointing the way for teaching planning and implementation.

The home work of student 11 is limited to chemical analysis of matter. Obviously, technical and methodological structures are equated, without considering conditions of the learner. On the one hand, the technical structure can provide supply and impulse for learning. On the other hand, chemistry-didactic variations should not be blocked, according to student needs. The teacher training must exercise different methodological strategies (*St 1*).

Theory - practical differences are expected (***St. 3, 8, 10***). As it was, they are a dilemma of didactical theory formations. The student processes of considerations are

methodologically very useful to calculate pedagogical and educational frictions and to develop elements of theory application in the educational field. Fortunately, many students reflect this dialectical situation (*St. 3, 6, 9, 10*). Teaching practice of chemistry teachers improve theoretical suggestions (*St. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10*).

1.5. Perspective – chemical education or literacy

Without doubt, commercials are interpreted in terms of knowledge based chemical education. All master's students consider commercials as motivational impulse to provide chemical structures and terminology and useful to confirm (*St. 1*). However, some students noted that methodological and didactic perspectives open up perspectives (*St. 8*) to dovetail chemical education with emotional (*St. 1*) and cognitive possibilities of students (*St. 7*) - just by acting and active learning (*St. 3, 5, 6, 7, 10*). Afterwards, chemical education is dynamically interpreted so as construction or acquisition of knowledge (*St. 3, 6, 9, 10*). Methodological considerations and decisions help a student-centered approach to make effectively (*St. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10*).

The considerations of the students are student-centered. Learners are the target group of all educational efforts, actually taken for granted. However, conditions of learners are reflected only rarely, in special age-related thinking and understanding possibilities. It seems that positive emotions and existing interests in chemistry at the same time are mandated, also options for actions and doings. Already, commercials are impulse to concrete chemical education in the sense of knowledge orientation and enrich the chemical curriculum (*St.6*).

Commercials as everyday phenomena must be understood and assessed by the learners on the background of their available conceptual knowledge (*St. 3, 5, 9, 10*). Nevertheless, these competencies are required by the Vietnamese education administration as an important goal of the chemical education. Occasionally, this aspect is methodologically much differentiated observed and implemented (mainly *St. 10*). Concerning moments of the learning psychology (*St. 10*), chemistry teaching has

- to reflect and problematize the pre-knowledge and imaginations of the pupils
- to discuss and communicate (different) perceptions
- to generalize evaluations and interpretations and
- to exercise the application of chemical knowledge in every daily life.

1.6. Perspectives – general overview

The "professional knowledge" of Master students is evident on the background of "all" observations. Students

- think methods-orientated,
- argue majority subject – oriented
- prefer chemical structures more than teaching-learning structures

- consider pupil orientation as complimentary additions of mediated mythological concepts
- want to make student-oriented education on the background of their own professional biographical experiences
- develop awareness of "methodical conceptual" variety
- extend methodical or didactic repertoire and
- reflect practical experiences with the concept "pupil orientation" on the background of the Vietnamese education situation

The professional skills of the students are quite developed to implement student orientation in the teaching of chemistry and to teach in future situations. Any instruction has to be aligned with the requirements of learners and to respect their thinking conditions. Of course, long-term methodological and societal impulses will shape an awareness of more pupil orientation. Didactical views of students are still methods and/or subject oriented concerning Chemistry Education, chemistry teaching, planning of lessons, and learning and understanding insights. At the moment the learning process is released or triggered by notifications promoting more receptive learning than learning by doing, so my experiences. Also, students must receive the chances to learn or educate by themselves. Scientific literacy offers such prospects as a concept of chemical education. It integrates cognitive, emotional, and manual facets. Therefore, it supports self-learning. Many students integrate their reports with seminar content. Their own points of view are proved with scientific literature. They apply knowledge; they strengthen; they expand; and they organize knowledge structures by themselves.

All students have accepted the bilingual claim of the seminar although the language requirements were very heterogeneous. In this respect, the written report was a reasonable practice to apply and to exercise English language in writing and without the pressure of the teaching situation (Becker & Kemper, 2018). The presentation of individual papers showed that the students support each other in the process to speak English. Educational sensibility or teaching experiences were experienced-significantly.

2. Consequences in general – Tasks for Teacher Training

In general, and exceedingly, *teacher training* is obligated to professional teaching activities and to reflect its university teaching practice. Concretely, students have to learn to develop and boost

- the learning processes,
- the understanding of the chemical knowledge and
- the chemical interest of the pupils.

The Methodologists have to practice their own teaching in the same entitlement. Then, the teacher students can be convinced to adopt pupil orientation in their future teaching activities. Therefore, the teacher students can expect that their imaginations about

chemistry teaching are respected by the Methodologists. So, the students can construct professional knowledge reconstructing their imaginations. A student oriented teacher training provides to teach pupil-oriented. At the same time, the Methodologists can strengthen their own competence to reflect boosting the quality of the university teaching practice.

In special, teacher training has to convey and to explain professional knowledge, and to practice or to apply teaching skills. Again and again mediated knowledge must be secured by independent applications in different contexts (Becker, 2019d). International research results to the students generally and effects of pupil orientation are to illustrate. Necessarily, such contents are to fix in the teaching curriculum. Master theses give students the chance to research about student behavior in the frame of teaching (Becker, 1998). Such student works contribute to methodological theory education (Ernst, 2001).

Developmental psychological considerations of pupil's features accentuate opportunities to encounter chemical learning difficulties. Basically, pupils need to develop

- cognitions (meta cognitions, thinking, ideas),
- affects (emotions, interests, motives) and
- motoric skills (doings, plot structures).

Simplified, the following panel painting illustrates the development of *mental operations* depending on pupil's age. The pupils already have some *Imaginations* about chemistry phenomena and chemistry terms. Based on these mental operations, the pupils interpret or explain chemistry (Becker, & Nguyen 2013a). Basically, three cognitive conditions are differentiated (*compare fig.*) to generate imaginations about chemical terms or contents. Ultimately, teachers have to know these imaginations in order to deconstruct them mentally. Then, learners can construct and mentally store objective meanings of chemical terms. The correlation between the age of the learners and thinking possibilities, especially formal thinking possibilities, is interpreted critically. International results demonstrate that the most people, students, and pupils have difficulties to operate and think in a formal way. As a result, the master's students assess their students' mental capacity realistically (see the bar list on the right of the figure). Formal-operational thinking with abstract terms can only be achieved "in a higher age" when it is at all. Especially in everyday situations, also in contexts with advertising, it becomes apparent that adults interpret chemical phenomena

- pre – operational, i.e. magical-mythical, animistic or
- real - operational, i.e. physical, vivid-concrete.

Thus, corresponding ideas about chemical phenomena are associated. Sometimes, imaginations are influenced by a commercial but not by chemistry teaching (Becker, & Pompetzki, 2008). But the most Commercials contain no objective chemical imagination – really (compare the student's work about advertising films). In general, chemistry teaching

is pupil oriented when teachers regard imaginations and thinking operations of the pupils. I have lectured different aspects of pupil behaviour in the past starting my lectures in HCMCUE in the year 2013 (Becker, & Nguyen, 2014).

The *cognitive theory of learning* can consider learning concepts in an overall context, i.e. to understand the structure and networking of knowledge as a learning moment. Teacher training must reflect appropriate measures on how pupil-oriented knowledge is anchored or consolidated in the thinking of students, for example

- by restructuring written materials,
- by analyzing texts and teaching descriptions,
- by summarizing of concepts and
- by reviewing them.

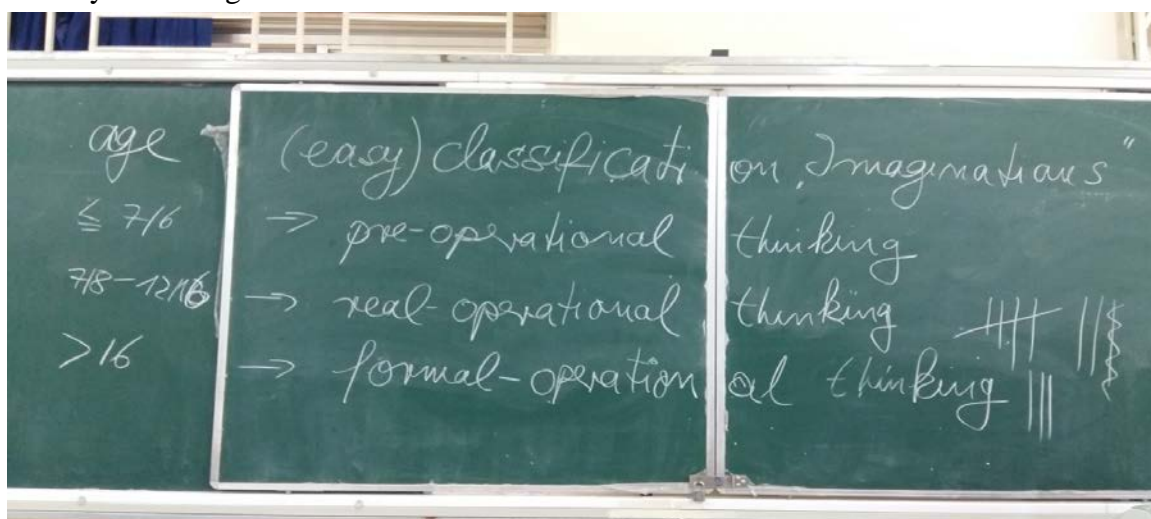


Fig. Influence of thought operations on imaginations in the dependence of age, the tally sheet is indentations of students, concerning their pupils

A large variety of *doings* and *thinking* can be used as learning activities. This, too, must be taught by teacher training. In this way, a pupil-oriented chemistry teaching can be stimulated or/and implemented:

- **Doings:** *observing, asking, imitating, separating, experimenting, experiencing, drawing, measuring, noticing, applying, testing, producing*
- **Thinking:** *evaluating, deducing, explaining, interpreting, comparing, generalizing, summarizing, analysing, structuring, determining, detecting, linking, transferring, reflecting*

Teacher behavior must be central for methodological studies. In the course of a methodological seminar for bachelor students, students have collected aspects on the question "What knowledge does the chemistry teacher have to have about students?" (HCMCUE, 4. December 2016). Their answers focus on the pedagogical knowledge of the students about pupil behavior, fixed as a panel painting:

Tab. Compiling results (Dec. 2016)

Trao đổi: Giáo viên hóa học cần biết gì về người học

- sự hứng thú
- kinh nghiệm
- kiến thức đã biết
- tưởng tượng?
- tâm lí
- tình huống
- tài năng
- nhận thức
- năng lực giải quyết vấn đề
- khái niệm
- kĩ năng thực hành/thí nghiệm
- tuổi

The meanings of these terms were presented by students in short lectures, switching between English and Vietnamese. Students name terms such as "kiến thức đã biết" (pre-knowledge), "tuổi" (age), "kinh nghiệm" (experience), "tâm lí" (psychology). Important prerequisites for a student-oriented teaching were associated and discussed in a methodological context. The students were convinced that the concept of student orientation increases the chemical knowledge of the learners. Chemistry lessons are being modernized and expanded in various perspectives (Dao, 2014). A pupil-oriented conception compliments the subject-orientated performance of teaching chemistry – in a dialectical matter. In the broadest sense, knowledge about cognitions, emotions, learning problems, ideas, personality, and development parameters of the pupils was associated.

Students should have the opportunity to actively and self-determinedly participate in teaching through (small) research activities. The university teaching is enriched and becomes effectively - after my long-time experience with a "**research-in-teaching-approach**" (Becker, 2019a). At the same time, the teacher is inspired to vary events in a high education-didactic manner – also to evaluate them self-critically, a “key to education” (VNS, 2019a). Students learn to structure and network aspects and knowledge elements of methodology. Complex relationships are clarified (VNS, 2019b). The Vietnam News, an English-language newspaper, has reported much problems and initiatives about the teacher training in 2018 regularly (Becker, 2013 - 2019). Educational processes as a university task are presented critically and comprehensibly for the public (Becker, 2019a).

The activities of the Vietnamese research community are numerous in optimizing school chemistry lessons with new scientific findings. Research projects on student learning, teacher behavior and university didactics of teacher training are focused. In principle, these research projects are already planned and prepared in the standard work of the Vietnamese chemical methodology of Nguyễn Cương (Nguyen, H. D. undated). The contributions in scientific journals of the pedagogical universities in Vietnam also show a trend towards empirical research (Nguyen, 2017, 2018).

❖ **Conflict of Interest:** Author have no conflict of interest to declare.

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Vietnam News (2019a). *Minister says happy studying environment is key to education*. (Issue 27. July).

Vietnam News (2019b). *Experiences is key for teachers, not extra qualifications* (Issue 20. Mai).

Note 1: Dr. Thai Hoai Minh, Chemistry Department of the HCMCUE, has translated title and abstract in Vietnamese. The author thanks Dr. Minh for the support and efforts to find solutions for translating which is faithful to the original text.

Note 2: M. Ed. Chu Ngoc Mai, teaching assistant of all nine lectures, has supported me as a translator and interpreter. The author would like to thank for this great support. The support was helpful for the master students to discuss the meaning of special terms in the frame of bilingual teaching.

Note 3: The Master's students Nguyen Thi Ai, Thai Ngoc Quynh An, Tran Xuan Dai, Ly Hai Dang, Mai Xuan Dao, Nguyen Thi Thu Hien, Nguyen Hoang Huy, Le Thi Phuong Lam, Nguyen Thi Kim Thi, Nguyen Thi Kim Thoa and Phouangmant van bounlakhone have taken part in the seminar. The author considers the interest in the conception "pupil orientation" and the exchange of experience in theory and practice. Many methodological questions of the students and conceptual discussions have enriched the seminar. The bilingual teaching situation has helped to clear up the meanings of didactical terms - relevant for this special conception. The comparison of subject orientation and pupil orientation has pointed out the dialectic of teaching - again and again.

**QUẢNG CÁO NHƯ MỘT PHẦN CỦA TÌNH HUỐNG CUỘC SỐNG
- ĐỘNG LỰC CHO VIỆC DẠY HỌC HOÁ HỌC
VÀ SỰ PHẢN HỒI VỀ PHƯƠNG PHÁP DẠY HỌC CỦA HỌC VIÊN CAO HỌC
TẠI TRƯỜNG ĐẠI HỌC SƯ PHẠM TPHCM (TỪ THÁNG 11 ĐẾN THÁNG 12 NĂM 2018)
(PHẦN 2)**

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TÓM TẮT

Bài báo trình bày về khả năng vận dụng didactic ở bậc sau đại học để đánh giá hiểu biết của sinh viên về thái độ của học sinh trong khung đào tạo giáo viên. Bài báo cũng đưa ra khuyến nghị việc dạy học Hoá học định hướng vào học sinh nhiều hơn so với hiện nay. Khái niệm về "dạy học hướng đến học sinh" được xem xét dựa trên những nỗ lực về chính sách về giáo dục ở Việt Nam. Tác giả đã cụ thể hoá những giải thích về khái niệm này dựa trên tổ chức hoạt động thuyết trình về phương pháp dạy học cho học viên cao học trên Tạp chí Khoa học của Trường Đại học Sư phạm Thành phố Hồ Chí Minh. Đồng thời, didactic về didactic Hoá học cũng được nhấn mạnh. **Phần 2** của bài báo phân tích và diễn giải những kết quả của học viên dựa trên nội dung của bài seminar. Bài báo cũng chỉ ra những hệ quả của việc đào tạo giáo viên về Phương pháp giảng dạy và cũng đề xuất những điều chỉnh có thể thực hiện.

Từ khóa: phương pháp giảng dạy ở bậc đại học; khái niệm dạy học định hướng học sinh; các quá trình học tập của học viên cao học; đào tạo giáo viên sư phạm Hóa học; quảng cáo