

Organising knowledge: The purpose and pedagogy of knowledge organisers

A knowledge organiser (KO) sets out the important, useful and powerful knowledge on a topic on a single page (Kirby, 2015). With the content demands of new courses, and schools adopting a knowledge-based curriculum, these are becoming increasingly popular in schools at secondary and even primary level. With this in mind, what are the key principles to ensuring that these are designed and implemented effectively?

For these to become a useful classroom and study tool, we should consider the **purpose** (what is the point of a knowledge organiser?), the **content** (what should be included and how should it be presented?) and the **pedagogy** (how can knowledge organisers become a practical tool used effectively by teachers and students?).

Purpose

For students to succeed in a particular area, they must have a foundation of factual knowledge, understand those facts in the context of a conceptual framework and organise knowledge in order to facilitate retrieval and application (Bransford et al., 2000). We can see knowledge organisers as a way to enable this, in a much more systematic way than traditional revision guides and textbooks.

There are many arguments made for the necessity of the memorisation of important knowledge. Our working memory capacity is limited, so by storing more in our long-term memory, we can free up working memory capacity (Paas et al., 2003). With careful design and use of knowledge organisers, we can construct schemas, complex architectures of knowledge stored in long-term memory, with a view to automating their use (Paas et al., 2004). For a relatively complex task such as writing an English literature essay, for example, we can reduce the extraneous cognitive load by allowing students to access knowledge and quotations from their long-term memory.

It should be noted that knowledge organisers have a purpose outside the more obvious benefits for students. The construction and regular use of knowledge organisers can also develop teachers' subject knowledge. The process of creating knowledge organisers in a specific subject then leads to a consideration of pedagogical content knowledge, the integration of subject expertise and an understanding of how that subject should be taught (Ball et al., 2008). A knowledge organiser can be a valuable starting point for effective curriculum design and a useful primer for those new to the topic.

Content

When making decisions about what must be included we have to consider that not everything *can* be included on an A4 piece of paper. So we must balance the need to use concise space-saving definitions while still including meaning enough for it to be useful. The finite space also leads to choices about which knowledge we deem most important and which we exclude. Powerful knowledge, as defined by Young (2013), is *specialised* rather than general knowledge, and is *differentiated* from the experiences of students. Finally, we have to decide which knowledge is most useful for the understanding of the domain and which is important for the *sample* of the domain – the assessment. For example, the continued development of the USSR post-1945 would be useful knowledge for students studying *Animal Farm* but would not be assessed, so should it be included on the KO?

As well as what to include, we also need to think about *how* the material is presented. In knowledge organisers, information is commonly presented in list form, which not be the best way to depict it in terms of showing links between ideas. It is therefore important that information is organised in such a way as to facilitate *further* organisation. Material should also be presented in such a way that it can be easily tested, to maximise the opportunity for retrieval practice.

Pedagogy

The use of knowledge organisers needs to be integrated into teachers' practice and students' habits. This includes using the following strategies regularly and routinely.

Regular retrieval practice is important, because active retrieval aids later retention (Roediger et al, 2011). This can take various forms, e.g. low-stakes quizzes during lessons, or writing down the dates for key events in a timeline from the KO. It could be free recall, where students write down everything that they can remember on the topic, before checking the KO, or perhaps filling in a blank (or partially blank) knowledge organiser. Testing will also identify gaps in knowledge, lead to more learning on the next study session and produce better organisation of knowledge (Roediger et al., 2011).

We should ensure that the material included in knowledge organisers is elaborated upon, by relating it to additional knowledge associated with it, often in the form of 'why' questions. There is an element of retrieval practice contained in this strategy, known as elaborative interrogation, but it works by ensuring that there is some sort of active understanding and meaningful consideration of what is being learnt (Willingham, 2014). Building complex schemas requires knowledge to be connected, so that this can be used when learning X by asking, 'How does concept X relate to concept Y?'

Finally, we should ask students to organise the knowledge into something different in order to help recall and further understanding. Reif (2008) lists some forms of knowledge organisation: nearly random organisation; lists; network (associative network, concept map); hierarchy. The strategy of elaborative interrogation can be used to help build these particular organisational structures, but students should be asked regularly to organise the knowledge contained on the KO into different organisational structures. For example, a list of key historical figures from the Second World War could be organised hierarchically in terms of power/status, could be built into a concept map or could be re-ordered into another list.

All of these strategies should be regularly used by teachers, but we must ensure that students are aware of how and when to use these strategies themselves, something that won't happen without explicit instruction (Zimmerman, 2010). When using knowledge organisers in class, teachers can articulate why the particular strategy being used is effective and model its use with the KO. For students to get the most out of this, we can encourage them to use the metacognitive regulation cycle: plan how to undertake the task; monitor the effectiveness of the strategy; evaluate the overall success (Education Endowment Foundation, 2018). For example, students might wish to learn a series of events and dates, so they might plan to use flashcards in several ways. They know that retrieval practice is effective so they use them to self-quiz. They know that elaborative interrogation is important, so they consider why each event was important and how it contributed to ultimate outcomes. They understand that knowledge may stick better if organised in different ways, so they organise the dates chronologically. They monitor which dates are known, then retest those not yet learnt. They reflect, following this, on tricky dates and then place each in turn in the centre of a concept map and consider how each relates to the other dates.

Knowledge organisers are not a silver bullet, but they can form a central part of any knowledge-based curriculum when used in this systematic, evidence-informed way.

References

- Ball DL, Thames MH and Phelps G (2008) Content knowledge for teaching: What makes it special? *Journal of Teacher Education* 59(5): 389–407.
- Bransford JD, Brown AL and Cocking RR (2000) *How People Learn*. Washington: National Academy Press.
- Education Endowment Foundation (2018) Metacognition and Self-Regulated Learning Guidance Report. Available at https://educationendowmentfoundation.org.uk/public/files/Publications/Campaigns/Metacognition/EEF_Metacognition_and_self-regulated_learning.pdf (accessed 1 July 2018).
- Kirby J (2015) Knowledge organisers. In: Pragmatic Education. Available at: <https://pragmaticreform.wordpress.com/2015/03/28/knowledge-organisers/> (accessed 1 July 2018).
- Paas F, Renkl A and Sweller J (2003) Cognitive load theory and instructional design: Recent developments. *Educational Psychologist* 38(1): 1–4.
- Paas F, Renkl A and Sweller J (2004) Cognitive load theory: Instructional implications of the interaction between information structures and cognitive architecture. *Instructional Science* 32: 1–8.
- Reif F (2008) *Applying Cognitive Science to Education: Thinking and Learning in Scientific and Other Complex Domains*. Massachusetts Institute of Technology: Bradford Books.
- Roediger HL and Karpicke JD (2006) Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science* 17: 249–255.
- Roediger HL, Putnam AL and Smith MA (2011) Ten benefits of testing and their applications to educational practice. *Psychology of Learning and Motivation* 55: 1–36.
- Willingham DT (2014) Strategies that make learning last. *Educational Leadership* 72(2): 10–15.
- Young M (2013) Overcoming the crisis in curriculum theory: A knowledge-based approach. *Journal of Curriculum Studies* 45(2): 101–118.
- Zimmerman BJ (2010) Becoming a self-regulated learner: An overview. *Theory Into Practice* 41(2): 64–70.